

**CLEAN GROWTH:
CLEAN ENERGY FOR CALIFORNIA'S
ECONOMIC FUTURE**

ENERGY RESOURCE INVESTMENT PLAN

of the

**CALIFORNIA CONSUMER POWER AND
CONSERVATION FINANCING AUTHORITY**

February 15, 2002

Energy Resource Investment Plan

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PREFACE

The statutory deadline for the first CPA Investment Plan is February 15, 2002. It comes at a time when California's energy situation is in transition. The crisis that began in June 2000 may be over, but the State does not yet have an adequate reserve. While many new power plants are under construction, the future construction plans of private developers are presently under review. At this time it is unclear whether private developers will invest in sufficient capacity to ensure that Western electricity markets are competitive. The investor-owned utilities are not yet creditworthy, and the Department of Water Resources' long-term contracts are being renegotiated.

In this period of uncertainty, this Investment Plan is offered not as a blueprint, but as an alternative plan to help ensure an adequate future reserve of electricity. We expect to adjust the Plan's implementation as events dictate and in coordination with the actions and programs of the CPUC, CEC, the CAISO and DWR. The proposals for Clean Growth (demand-side programs and renewables) outlined in this Plan can help keep rates stable and power flow reliable. However, the CPA wants to emphasize that the Plan is a work in progress that will benefit from legislative hearings and further scrutiny by the many stakeholders who have a continuing interest in developing and implementing cost-effective and environmentally sound solutions to current and future gaps in the system. The CPA may provide Plan updates as events and policy discussions take shape. In light of the serious transition underway, the CPA Board will review the Plan at least quarterly throughout 2002. The Plan is presented to the Governor and the appropriate committees of the Legislature in this spirit.

Clean Growth: Clean Energy for California's Economic Future

1. Executive Summary

Situation

- *Gaps* – There are a number of unmet needs in California's energy situation:
 - uncertain and inadequate reserves,
 - lack of fuel diversity,
 - lack of consumer choice, including for green energy,
 - diminishing voluntary conservation, and
 - erosion of integrated resource planning and procurement processes that value adequate reserves and renewable resources and link resource investments and procurement to the service obligations of load serving entities.¹
- *Clean Energy Is Available* – There are sufficient economic resources of Clean Energy – energy efficiency, load management, renewables and clean decentralized generating resources – to meet future reserve capacity needs.

CPA Proposal

- *Clean Growth* – The California Power Authority (CPA) proposes a “clean growth” strategy for the State. This strategy will require the cooperation and actions of all energy agencies as well as the Legislature and Governor. The “clean growth” strategy can be implemented in the most efficient and cost-effective manner with the involvement of the investor-owned and municipal utilities and the private sector for both conventional and renewable generation. The CPA can finance 3,500 MW of capacity through clean resources to ensure adequate reserves in 2006.
- *Policy* – As procurers of supply in competitive wholesale markets, supplementing their own “native” capacity, load serving entities are key vehicles through which CPA will pursue “clean energy” options, capacity reserve requirements, and reliability/price stability objectives. CPA supports proposed policy changes to make all load serving entities responsible for procuring renewables and demand-side measures to achieve adequate reserves to protect their customers.
- *System Integration* – Gaps in integrated resource planning will be addressed through working relationships with sister agencies that regulate load serving entities. Implicit in this commitment is the need to restore market-compatible linkages between “obligations to serve” and responsibilities to build and

¹ Load Serving Entities (LSEs) is a term for those entities providing electric service to retail customers – including the investor-owned utilities (PG&E, SCE, SDG&E), municipal utilities, energy service providers to direct access customers and, on an interim basis, the Department of Water Resources (DWR), which supplies part of the load for retail customers in the service areas of the investor-owned utilities.

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maintain a balanced mix of energy resources where such linkages have not been served by regulatory policy under utility restructuring.

- *Strategy* – The CPA Clean Growth Investment Portfolio will use its \$5 billion bonding authority in a three-pronged strategy:
 - Clean Energy Financing;
 - Strategic Reserves to help meet peak demand and address local reliability needs; and
 - Greening Public Buildings to finance efficiency and renewables in public buildings throughout California.

Benefits

- *Several Major Benefits* – There are significant benefits to California from investing in Clean Growth: adequate reserves; a more secure energy system; more job creation and economic development; increased fuel diversity; cleaner air and environmental justice.
- *Cost Beneficial* – The proposed CPA Portfolio will cost less than most Californians currently pay for the generation of electricity.
- *Coordinated Implementation* – The CPA implementation plan will be closely coordinated with the programs and actions of the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), the California Independent System Operator (CAISO) and the Department of Water Resources (DWR).

This Plan sets forth a path to assure energy reliability and security for California with a set of actions that must be implemented by several agencies and players. It also identifies the types of actions that will be taken by the CPA using its unique legislative mandate and financing authority to contribute to the overall Clean Growth strategy.

This Plan contains a nine-page summary, followed by sections which provide more detail on the CPA's roles, the California energy market situation, the CPA's proposed Clean Growth Portfolio, a benefit-cost assessment of that Portfolio, the financial plan behind this Portfolio, and the CPA's next steps. Appendices provide a background description of reserve margin issues, a list of the 2,400 MW of Letters of Intent signed by the CPA with renewable suppliers, the benefit-cost methodology, and information about the CPA's public input process.

2. Summary

The Legislature created the California Consumer Power and Conservation Financing Authority (CPA) to:

- “furnish the citizens of California with reliable, affordable electrical power,
- ensure sufficient power reserves,
- assure stability and rationality in California’s electricity market,
- encourage energy efficiency and conservation as well as the use of renewable energy resources, and
- protect the public health, welfare and safety.”²

As a crucial step toward these purposes, Public Utilities Code Section 3369 directs the CPA to submit an Energy Resource Investment Plan (Investment Plan or Plan) to the Governor and Legislature within 180 days (February 15, 2002). The Plan “shall outline a strategy for cost-effective energy resource investments, using the financing powers provided to the CPA by this division.”³ This document is the CPA Energy Resource Investment Plan.

Gaps

In reviewing the California electrical power situation for the foreseeable future, the CPA found several gaps:

- **Uncertain and inadequate reserves** – The California Energy Commission (CEC) projects modest growth in electricity demand in the next decade and finds that under several plausible scenarios California’s statewide reserves could be inadequate for maintaining reliability. Uncertainty has increased in recent months as project developers have halted committed projects in California’s energy market.
- **Inadequate fuel diversity** – There is a need for diversifying the fuel mix to put more emphasis on efficiency and renewables and less on natural gas – and there are challenges to meeting the goal of 20% renewables by 2010, as endorsed by the Governor.
- **Customers do not have choice** – Californians no longer can choose resource options from the central grid to meet their electricity needs, including for clean energy. Renewable generators no longer have eligible buyers – at the retail or wholesale level.
- **Voluntary conservation efforts appear to be tapering off** – Californians are now saving less than during last year’s emergency. Refocusing Californians on significant opportunities for permanent efficiency changes is necessary.
- **Localized reliability concerns** – The California Independent System Operator (CAISO) and CEC have identified some local areas, especially the San Francisco

² Public Utilities Code Section 3300, Chapter 10 – enrolled 16 May 2001, effective 13 August 2001.

³ Public Utilities Code Section 3369(c).

- San Jose corridor, that face reliability problems and could benefit from targeted enhancements.
- **Undermining of Integrated Resource Planning** – The engagement of investor-owned load serving entities in integrated resource planning has been undermined in the process of utility restructuring. This engagement is critical in the context of the proactive planning role required to meet consumer demand day-to-day and in real time.

The CPA finds that *an aggressive investment in energy efficiency and renewable energy resources* is the heart of a cost-effective energy resource investment strategy that addresses these gaps and that accomplishes the intent of the legislation that established the CPA.

Reserves

The CEC has analyzed various possible future scenarios of supply and demand which produce a range of plausible reserve margins above and below 15%. The CPA will work with the CEC, the CPUC, and the CAISO during the next year to determine the appropriate reserve margin target in California's evolving market structure. In the interim, using an assumed reserve margin of 15%, the CPA finds that the CEC's lowest reserve margin scenario is short in 2006 by 5.9% (or 3,500 MW) – and even shorter in 2012. *There is sufficient opportunity in Clean Energy – energy efficiency, load management, renewables and clean decentralized generating resources – to meet any plausible reserve capacity gap.*

Recent events have created much uncertainty about both the supply and demand projections into the future. The September 11 attack and its economic impact, the future of conservation, and the impact of electricity rate increases make demand forecasts uncertain. The recent bankruptcy and downgrades to the credit ratings of major power suppliers make the supply picture equally uncertain. A number of power plants included in supply projections have been placed on hold indefinitely in recent months due to poor economic conditions and jittery energy investment markets.

Even with the wave of postponements and cancellations, some 3,000 to 10,000 MW of new construction of gas-fired plants are underway. 3,000 MW are almost certain to be completed in another year or two. Conservation not financed by the CPA will also continue. These new plants and existing conservation efforts, in combination with CPA efforts in efficiency, conservation and renewables, can fill any level of gap that may be needed.

California, and hence the CPA as well, now face a choice. The CPA can facilitate meeting the projected load growth or reserve margin gap by following a “business as usual” approach exclusively with fossil fuel central plants or by implementing a new “clean growth” strategy.

Clean Growth Strategy

The CPA proposes a “clean growth” strategy under which CPA financing will provide 3,500 MW of the capacity needed to ensure adequate reserves in 2006 through clean resources – efficiency, load management (which reduces demand at critical times), clean distributed generation and renewables. CPA projects can be the cornerstone for a statewide clean growth future providing up to 8,000 MW, if needed.

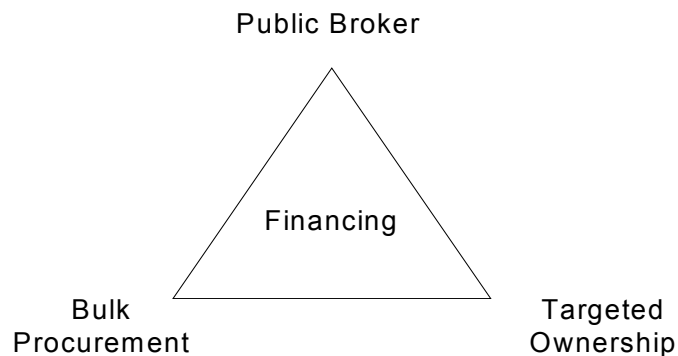
One thing is clear – the level of reserves California has today is inadequate to remove concerns about blackouts and price spikes. California needs to add conservation and renewables to its system over the next two years.

The CPA’s ability to accelerate the use of clean resources to enhance reserves provides good insurance for the State’s electricity reliability. Moreover, even if lower loads are the order of the day in the future, the increase in efficiency, load management and renewables facilitated by the CPA will provide the State with significant economic and environmental benefits and allow the earlier retirement or repowering of older, dirtier fossil fuel-fired plants.

CPA Services

To enhance the State’s power system reliability, the CPA proposes to use its bonding authority to lead other state agencies and the private sector in a Clean Growth strategy that delivers 3,500 MW by 2006. To implement this strategy, the CPA will provide three general types of services – Public Broker, Bulk Procurement, and Targeted Ownership of projects – to assist other state agencies and the private sector in using its core service of financing (illustrated in the graphic below). The CPA will provide these services in coordination with the load serving entity to ensure that CPA-endorsed resource procurement is integrated with the needs of the entities that must meet customer demand day-to-day and in real-time. This load-matching perspective will help avoid oversupply in certain hours, days or months.

Figure 2-1. CPA Services



Financing. In its core service, the CPA will issue bonds for up to \$5 billion to help finance the development and installation of renewable energy, efficiency and select gas technologies needed for local reliability or re-powering old dirty plants. Only \$1 billion is authorized for efficiency projects. CPA financing will typically be provided to utilities or to power plant developers who provide power at a price that reflects their generating costs⁴ under a long-term contract to load serving entities. Alternatively, the financing will be provided to public entities or through a loan pool to individual businesses and consumers for energy efficiency and distributed generation. Financing provided in loan pools or to private developers will probably not be tax-exempt.

Public Broker. The CPA will serve as a broker in several ways. First, the CPA will address institutional and other barriers to facilitate contracts between load serving entities and “clean” suppliers and provide financing where appropriate. The CPA has already helped some existing renewable suppliers contract with buyers and has 2,400 MW of Letters of Intent for other renewable projects in hand. Second, as appropriate, it will help fund and package both private and other public financing/incentives to leverage CPA bond financing. Several entities express a willingness to partner with the CPA, including the Federal National Mortgage Association (FNMA), some power project developers, and several private financial institutions.

Bulk Procurement. Renewable energy suppliers, especially of distributed resources like solar photovoltaic (PV) and fuel cells, have indicated they could significantly lower costs if they had a predictable, multi-year, higher-volume supply contract. The CPA plans to organize larger purchases of certain distributed resources for installation at public buildings, thereby achieving lower costs for all Californians wanting these resources.

Targeted Ownership. In selected instances, the CPA will own resources to ensure a critically needed power plant is built or to achieve lower costs to the consumer. These facilities would be operated by experienced private sector parties. In the vast majority of cases, however, the CPA envisions facilitating the financing of power plants owned by private investors under long-term contracts with load serving entities like electric utilities.⁵ This approach combines the efficient operations of the private sector with the assurance that plants are operated in consumers’ interests.

CPA Role

The CPA expects the private sector (both energy producers and energy consumers) to play a major role in financing, constructing, operating and owning clean resources. This will be accomplished largely by regulatory policies to require the load serving entities to develop reserves and portfolio options under the public policy mandates of existing

⁴ Pursuant to Public Utilities Code Section 3351(a).

⁵ See note 1.

regulatory authority. In the context of the State's hybrid system as it is being revitalized, the CPA has a major responsibility to bring environmentally sensitive resources and capacity into the mainstream of the electricity supply system. CPA priorities are conservation, energy efficiency, and bringing renewable resources and advanced distributed generation technologies such as photovoltaics, fuel cells, and combined heat and power systems into the resource mix in a cost-effective way. The potential role of the marketplace in these priority areas of energy/capacity development opens up new options for competitive forces to provide viable alternatives to the current fossil fuel-dominated energy future.

The CPA recognizes that other state agencies continue to play leading roles in advancing efficiency and renewables and is committed to a strong working relationship to advance mutual goals. The rebates and interruptible rates initiated by the CPUC, the renewable subsidies and low interest loans from the CEC, and the planning, scheduling and operations by the CAISO continue to be the heart of state energy efforts. The CPA expects these bodies to continue to play lead roles in shaping institutional energy policy and the rules for achieving that policy.

Finally, the CPA expects and encourages the investor-owned utilities under CPUC direction and other load serving entities to be responsible for procuring and scheduling energy and adequate reserves to serve their retail customers. The CPA will provide a low-cost option for these entities in procuring future clean resources. The CPA will provide these services in tandem with other private and public entities to implement clean resources.

The CPA statute directs the CPA to make the investments necessary to sustain adequate reserves of power. Toward that end and working in coordination with these other entities, the CPA recommends that the State build upon the success of the statewide campaign that netted 3,500 MW of demand reduction during the summer of 2001 – primarily in operational savings. The plan is now to motivate permanent efficiency changes and new renewables through programs that enlist the management of California's businesses, California residential consumers, and private companies to build and install the necessary equipment.

CPA Clean Growth Portfolio

These efforts will allow the CPA to achieve a Clean Growth Portfolio using its \$5 billion bonding authority in a three-pronged investment strategy. The three prongs are:

1. **Clean Energy Financing** – using the CPA's capability to facilitate financing clean resources – renewable energy, energy efficiency and clean on-site power technologies. Initial projects include:
 - *New Centralized Renewables* – facilitate financing and procurement of about 475 MW firm capacity of new renewables (1,275 MW installed capacity)

chosen from projects submitted to the CPA or CEC. The CPA has 2,400 MW of signed Letters of Intent.⁶

- *Existing Centralized Renewables* – broker procurement of 150 MW of existing biomass plants so that they keep providing air quality and solid waste management benefits.
 - *Customer Efficiency & Renewables* – provide consumers and businesses the opportunity to finance energy efficiency and renewables (150 MW in the private sector) in various ways, including through their utility bills.
2. **Strategic Reserves** – targeting resources to help meet peak demand and system or local reserve needs. Initial projects include:
- *San Francisco-San Jose Corridor Project* – a power supply project designed to enhance local reliability in this grid-congested area.
 - *Greening the Peak* – contract for 1,000 MW of demand-side reserves (for most of which the CPA has Letters of Intent) within the next year and 1,900 MW by 2006, plus 100 MW of peaking capacity powered by renewable fuels, increased use of real-time metering to lower peak demand, or re-powering dirty plants needed for local reliability. The demand-side reserves are dispatchable by the CAISO, which balances the variation in output by some renewables.
 - *Safety Net* – assure lower cost construction of new power plants under existing contract to the California Department of Water Resources (DWR) that will provide needed reliability protection and displace output from dirtier plants.
3. **Greening Public Buildings** – targeting clean resources to meet by 2006 twenty percent of the estimated 3,300 MW electricity demand of all public buildings – state and local government, schools and possible participation of federal facilities. The CPA is receiving responses from Requests for Bids that could provide up to 200-500 MW of clean distributed generation for public buildings through a bulk procurement process, thereby lowering installed costs for all consumers.

⁶ Firm capacity is the amount of megawatts the system planner can depend on being available when needed. Installed capacity is the maximum output at which a power plant is designed to operate. The maximum output of some renewable resources, such as wind, does not necessarily occur when needed most.

Table 2-1. CPA Portfolio Summary*

	2002-03				By 2006			
	Total Capital (\$million)	Annual Generation (GWh)	Peak Capacity (MW)		Total Capital (\$million)	Annual Generation (GWh)	Peak Capacity (MW)	
Clean Energy Financing	\$1,948	5,240	650	**	\$2,251	5,451	775	**
Strategic Reserves	\$164	175	1,150		\$258	298	2,100	
Greening Public Buildings	\$75	158	30		\$1,565	3,285	625	**
Totals	\$2,187	5,573	1,830		\$4,073	9,034	3,500	

* About 70% of the capacity and 20% of the energy comes from customer efficiency and demand reduction.

** Firm peak capacity for wind is 20% of installed capacity.

By 2006, this Plan reflects 1,000 MW installed capacity (200 MW firm capacity) of wind, and 1,200 MW total firm capacity from efficiency, biomass, geothermal, photovoltaic, landfill gas, fuel cells, solar thermal, and combined heat and power, yielding a total of 1,400 MW from Clean Energy Financing and Greening Public Buildings strategies.

As the Portfolio shows, the CPA estimates that its initial projects will achieve 1,830 MW of firm capacity during 2002-03. Even the most conservative estimate of the reserve gap suggests that at least that much will be needed. This will come from a pool of CEC-identified renewable projects and 3,400 MW of projects for which the CPA already has Letters of Intent – mostly from wind, biofuels, and demand-side reserves. The CPA expects the installed cost of these projects to be \$2 billion.

By 2006 CPA plans to have installed projects providing 3,500 MW of firm capacity and 9,000 GWh of energy, if they are needed. The CPA expects the cost of this to be about \$4 billion, allowing room for covering financing transaction costs and reserves within the \$5 billion financing authority.

Benefits

There are significant benefits to California from investing in the CPA Clean Growth Portfolio. Greater benefits would be possible beyond 2006 from expanding to meet all load growth with clean resources. Over a twenty-year time horizon the Clean Growth Portfolio will provide the following benefits:

- **Increase reserves** by using clean resources to levels deemed optimum for reliability and to support competitive pricing in energy markets. By doing so California can:
 - enhance reliability, especially in grid-congested areas such as the San Francisco-San Jose corridor, and

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- lower overall electricity costs by \$20-40 billion, primarily by mitigating excessively volatile spot prices.
- **Better secure California's energy system** against disruptions by diversifying the fuel mix and decentralizing the resource base.
- **Create 4,000 more jobs** than available under a conventional resource strategy.
- **Reduce purchases of \$4 billion of natural gas**, dollars now sent out of California rather than remaining in the local economy.
- **Provide an economic development bonus of \$11-20 billion** inside California from an increase in jobs, property tax revenues, and potentially the in-state manufacturing of renewable power systems.
- **Reduce greenhouse gas emissions** (carbon dioxide) by up to 60 million tons. This is the equivalent of taking a million cars off the road.
- **Enhance environmental justice** by displacing older diesel and natural gas-fired power plants, and in so doing reducing air emissions in minority and low-income, industrial neighborhoods where these plants are often located, and by capturing clean power opportunities across all areas of the state.

Table 2-2. Twenty-Year Impacts of CPA Portfolio

	Business As Usual Portfolio	CPA Portfolio	CPA Impact
Investment (\$million)	\$ 2,583	\$ 4,073	\$ (1,490)
Environmental Impacts			
NOx (thousand tons)	6	5	1
CO2 (thousand tons)	74,593	13,051	61,542
Security			
Resource Diversity	No	Yes	Increased
Decentralized	No	Mostly	Increased
Economic Development			
Jobs	968	4,528	3,559
Tax Revenues (\$million)	\$ 426	\$ 746	\$ 320
Gas Purchases (\$million)	\$ (4,080)	\$ (391)	\$ 3,689
Total Effect			
Out-of-state manufacturing	\$ (1,763)	\$ 8,900	\$ 10,663
In-state manufacturing		\$ 17,800	\$ 19,563

CPA Financing

The CPA statute authorizes \$5 billion in revenue bonds. As a new agency, the CPA has no assets. Any project that the CPA seeks to finance must have a secure revenue stream to repay the amount borrowed with interest. Otherwise, the CPA will not approve the project.

One key ingredient is a market or buyer for the energy output of any project. The investor-owned utilities do not yet present a market, and DWR is in its last year of procurement unless its emergency statute is extended. The CPA proposes that output from its grid supply projects in 2002 be sold to DWR with rights of assignment to the load serving entities at an appropriate time. The CPA expects to involve all concerned – DWR, the utilities, and the CPUC – in any projects the CPA finances or acquires. Such a cooperative approach is important so that the projects are just and reasonable, fit in the State's portfolio, and thus can be readily financed.

CLEAN GROWTH. It is more than a nice slogan. It is more than a good energy and environmental strategy for California. It will add to the State's economic strength with more jobs. But it requires a longer-term perspective and financing capability to happen. The CPA provides that perspective and capability. The CPA, with other State agencies, will move Californians a step closer to the cleaner resource mix they prefer, and a step closer to meeting the CEC's and Governor's goals for renewables – 17% by 2006 and 20% by 2010. In a different age, nuclear power was portrayed as desirable because it would be "too cheap to meter." California's clean growth approach should recognize that "clean power is too precious to waste."

3. The Roles of the CPA

As listed in the summary, there are five legislative mandates given to the California Power Authority in Public Utilities Code Section 3300. Those five mandates are to:

- Furnish the citizens of California with reliable, affordable electrical power.
- Ensure sufficient power reserves.
- Assure stability and rationality in California's electricity market.
- Encourage energy efficiency and conservation as well as the use of renewable energy resources.
- Protect public health, welfare and safety.

This section describes how the role of the CPA compares first to the private sector and to other state organizations. It then describes how the CPA intends to meet its statutory roles.

The CPA's Role Relative to the Private Sector

The CPA Investment Plan can be carried out so as to be compatible with sustained investment by private enterprise. The CPA plans to encourage private investment to achieve and sustain an adequate reserve of electricity. The CPA's role is to utilize its financing authority, as needed, to achieve that goal.

The California experiment with "deregulation" – more appropriately termed "restructuring" because the approach was flawed and lacked several key characteristics of a competitive market – eventually contributed to the lack of adequate supplies, blackouts and runaway prices, which are not in the public interest. A competitive market can be structured to operate in the interests of ratepayers and taxpayers, but it must be operated with rules that encourage private investment, foster competition, and mitigate price spikes. The CPA, in cooperation with other energy agencies, is committed to identifying and pursuing strategies that will allow the marketplace to operate in the interest of all consumers – residential, business, industrial, government and community – in the most cost-effective and environmentally responsible manner.

On the other hand, the State has a continuing need for private investment in new power plants and the proper maintenance of existing plants owned by private companies. The California experience makes clear that necessary private investments will not be made unless the generating companies can earn a profit, including a return on their investments.

Analysis reveals that the "boom and bust" cycle in the market has been largely caused by the way electricity has been priced in California since 1997. With the surplus California had in 1997-1999, electricity sold almost exclusively on the spot market at prices that reflected little more than the operating costs of a gas-fired plant but not the capital investment. As a result, no new major plants were built and by 2000 California started experiencing the pain of shortages.

The increased prices of 2000 and 2001 did bring forth a large response of new gas-fired power plant proposals and, with the streamlined siting process the Governor ordered, a number of new plants have been built. But plans for new merchant plants are being cancelled as prices in the spot market go back toward the marginal cost of operation. The vast majority of the plants that are being completed are those financed by long-term contracts with the DWR.

There is danger, however, in that the State is still short of the minimum reserve needed to have reliable, affordable power. And it is unrealistic to believe that private companies will invest in additional new power plants of any kind without a market that will assure them at least a fair profit on their investment in addition to their marginal costs of operation.

In a competitive market the universally accepted mechanism for achieving a reliable flow of power without the danger of price spikes is a portfolio of long-term contracts. These contracts must be at prices that reflect a competitive market that includes the cost of capital.

The numbers from the CEC project a potential need over the next decade of 8,000 MW of additional conservation or supply – in addition to replacements that may be needed for the large numbers of old power plants that need to be retired. While conservation can make a large contribution, additional power supply is also needed and it is preferable that private companies make that investment. The CPA wishes to encourage – not discourage – private enterprise to build renewable energy projects, peakers in reliability sensitive areas, and any other needed investments. The CPA wants private developers to look to California as a place for future business. But if the generators do not build to sustain an adequate reserve, it is the CPA's job to see that it is done.

The key role of the CPA for the immediate future is to be a source of financing and aggregation of about 3,500 MW of smaller renewable projects and needed demand-side projects. The CPA can serve as a broker for DWR and all the load serving entities to utilize CPA financing to reduce the cost of renewable energy and conservation and develop reasonably priced projects for their customers under long-term contracts. The CPA has no interest or desire to displace any private enterprise in California. In fact, the CPA encourages and will facilitate needed projects with financing and long-term contracts. Moreover, if California follows the Clean Growth path, there will be an even larger role for private enterprise.

For a variety of reasons the three large investor-owned utilities currently are in transition but are not yet able to enter into long-term contracts. For now, the CPA can enter into needed contracts with the DWR with provisions to assign them to the investor-owned utilities once they assume their normal role of buying the power for their customers.

The CPA endorses the proposals to require the load serving entities to acquire their own reserves when they purchase the power needed by their customers. But the power supply

and demand-side programs do not exist today to supply an adequate level of reserves. The regulatory framework must be modified to allow revenue streams to be realized in order to finance and achieve reserve capacities. In the absence of such reform, simply requiring more reserves will not cause them to be developed.

Additional long-term contracts are needed to diversify our supply with renewable energy and build peakers in the areas they are needed for reliability. Of course, all the long-term contracts must be at reasonable prices and on reasonable terms that reflect competition, not the shortage of a year ago. They need to provide sufficient returns to attract the needed private investments.

The CPA's Role Relative to the Other State Agencies and the CAISO

The CPA differs from the other energy agencies (i.e., CEC, CPUC, EOB, DWR/CERS and the CAISO)⁷ in that the CPA is a financing authority that is entrepreneurial and self-supporting through its activities. Figure 3-1 outlines the responsibilities of the various energy agencies in California. Unlike the other agencies, the CPA can acquire capacity and energy to avoid shortages. The CPA is not a regulatory agency. It does not license power plants and make load forecasts as does the CEC. It does not duplicate the work of the CPUC and CEC. As a financing authority, the CPA will undertake bond transactions to fulfill its statutory mandate to furnish Californians with reliable and affordable electrical power.

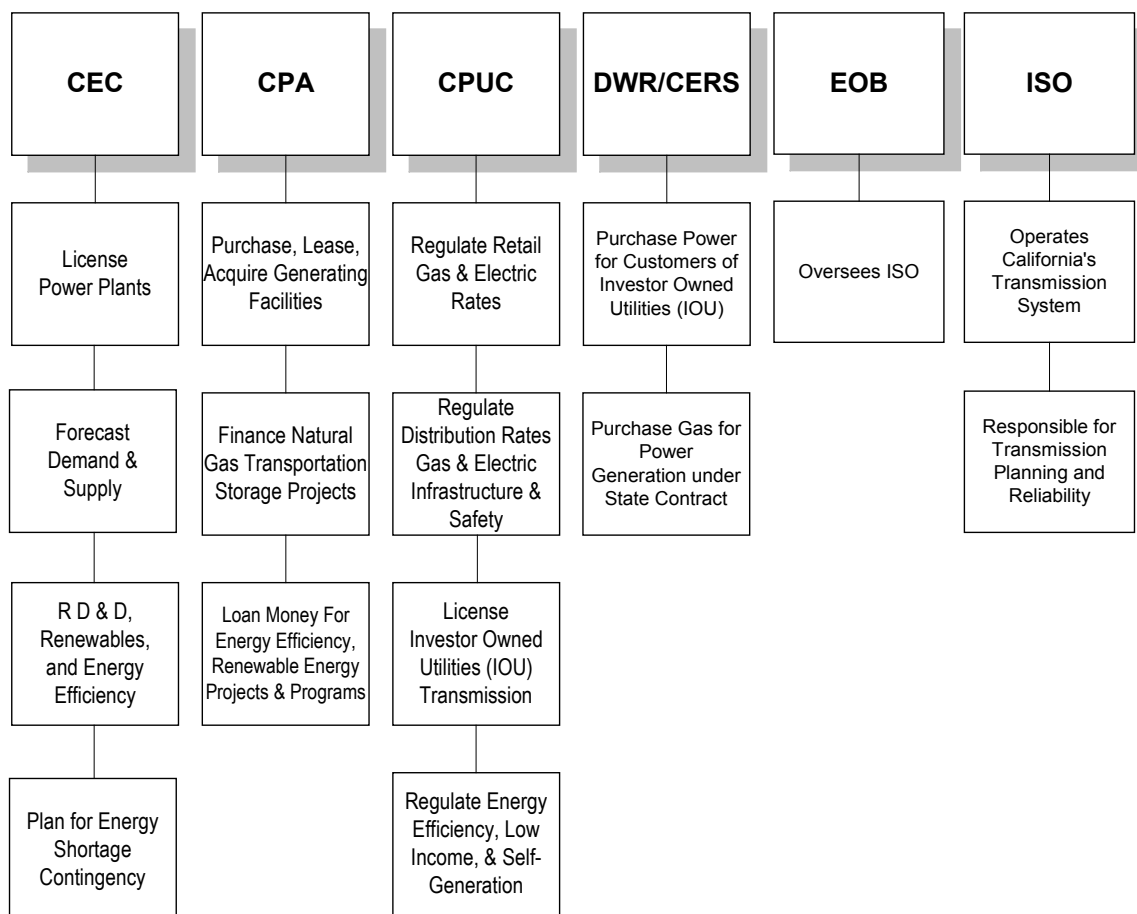
The CPA's financing will be for projects and programs where others could not or have not invested or for which the CPA's lower costs can benefit California consumers. Through its financing authority, the CPA will invest in and/or acquire generating facilities as necessary to maintain adequate capacity reserves and to help develop the expansion of renewable energy and demand-response/conservation projects and programs.

Most CPA-financed centralized renewable projects will require long-term power purchase agreements with load serving entities. For any contracts with investor-owned utilities, the CPA will work in partnership with the CPUC so that decisions can be expedited and subsequent assignment facilitated. This approach should lead to long-term contracts that are just and reasonable and the most important tool in keeping a sustainable competitive market.

The CPA is committed to working with the CPUC in its rule-making proceedings on utility procurement and renewable resources to rebuild the proactive roles of utilities in resource planning, development and implementation. In its work with the CPUC, the CPA recognizes that integrated resource planning is a critical element in the strategy to restore market compatible linkages between the obligations of utilities to serve and their obligations to procure energy, develop resources and achieve energy efficiency.

⁷ California Energy Commission (CEC), California Power Authority (CPA), California Public Utilities Commission (CPUC), Electricity Oversight Board (EOB), Department of Water Resources' California Energy Resource Scheduler (DWR/CERS), and Independent System Operator (ISO).

Figure 3-1. Energy Agencies in California



The CPA's Role in Assuring Reserve Sufficiency

The CPA's primary statutory responsibility is the assurance of sufficient reserves. In reviewing the current market situation, the CPA concluded it is premature to determine the precise reserve margin needed in California. The CPA plans to work with the CAISO, CEC and CPUC during the next year to determine target reserve levels. In the interim, the CPA will use 15% as a provisional standard for planning reserves since it is in the range of historic levels and consistent with the range of current analysis.

Adequate reserves are important for two main reasons:

- a. to maintain reliable electric service;
- b. to enhance electricity market stability by mitigating price spikes.

It is evident that reserves need to be sufficient to prevent blackouts. What is not well understood is that in a market structure where bidders supply electricity and reserves it is necessary to have reserves large enough to mitigate price spikes. Higher reserves prevent

the exercise of market power during times when supplies are tight. California recently paid about \$40 billion above historic levels for power – \$20 billion extra in both 2000 and 2001.⁸ Maintaining an adequate reserve margin is much cheaper than re-experiencing such costs.

While a decision can be deferred about the precise reserve level needed by 2006, it is important to acknowledge that current reserves are inadequate. The CPA Plan will add 1,800 MW in the next two years toward its goal of 3,500 MW by 2006 to ensure adequate reserves.

The CPA intends to ensure sufficient power reserves in cooperation with other organizations. The CPA is participating in the CPUC procurement proceeding to advocate for the inclusion of renewable resources. The CPA also supports a change in the CAISO rules to require every load-serving entity to acquire at least a 7% operating reserve along with the load it acquires to serve its customers. The additional capacity can be acquired by the CPA on behalf of the load serving entities.

It is critical to note that the addition of capacity comes not only from traditional generation and renewables. Demand-side options are a winner in today's economics. It is thus clear that the role of the CPA is to work with the CEC and the CPUC to assure that demand-side programs are available. That means programs need to be reliable, dispatchable and tested in advance in order to provide reserves when needed, without burdening consumers with costs when they are not needed.

The CPA's Role in Encouraging Efficiency, Conservation and Renewables

A second clear role in the mandate from the Governor and Legislature is to “encourage energy efficiency and conservation as well as the use of renewable energy resources” in enhancing statewide reserves. A subsequent section will highlight 15,000-20,000 MW of cost-effective potential from these options and the public preferences for clean resources. Indeed, the public responded well to the electricity “perfect storm” of 2000-2001 by reducing critical summer peaks by over 10%. Now is the time to leverage public awareness to implement sustainable clean energy solutions that match public preferences. The CPA therefore recommends that California now plan for the implementation of 8,000 MW of clean resources, using CPA financing and funding from others, to achieve Clean Growth.

The CPA starts with the goal and assumption that the economy of California will grow at a healthy pace and accepts the work of the CEC for the detailed numbers. The CEC estimates electric power needs will grow by some 7,200 MW over the next five years. The issue is not whether that growth should take place – it should – but rather how it will be satisfied.

⁸ According to the CAISO Department of Market Analysis, total energy and ancillary services costs increased from \$7.4 billion in 1999 to \$28 billion in 2000 and \$27 billion in 2001. For 2001 costs, see CAISO, *Market Analysis Report for October 2001*, 19 November 2001. For 1999 and 2000 costs, see CAISO, *Market Analysis Report*, 16 January 2001.

If California leaves the provision of new supply entirely to the market, in addition to the risk of shortages and volatile prices, gas-fired power plants are likely to supply the growth. More and more natural gas means putting “all our eggs in one basket” and risking rate shock when the uncontrolled price goes up, as it almost certainly will. It also means more air pollution in a state where most people breathe air that is already unhealthy.

The market favors natural gas-fired plants because they have a low initial cost. To meet Californians’ preferences, it is critical to have the longer-term perspective that the CPA’s financing capability provides. Moreover, a shift to capital-intensive clean resources benefits Californians economically as well. As discussed more in Section 6, these clean resources:

- provide more jobs;
- reduce the amount of dollars spent on natural gas supplies from outside California; and,
- better enhance economic development through a stronger property tax base and dollars recycled through the local economy.

To achieve these benefits, the CPA must play an active role, along with the CEC, CPUC, utilities and others, in financing and delivering clean energy options to Californians.

The CPA’s Role in Protecting Public Health, Welfare and Safety

For thirty years, public policy has consistently resulted in tougher and tougher air quality standards. These standards have come as more is learned about the health hazards of dirty air, impacts of acid rain on forests and lakes, and concerns associated with global climate change. As a result, electric power production has been required to shift fuel sources dramatically, moving away from coal and oil toward natural gas. Yet most Californians still breathe unhealthy air. As Figure 3-2 shows, most Californians live in areas with ozone exceeding acceptable levels.⁹ The increasing population and associated increase in power and other energy needs presents a challenge to meeting clean air standards.

The legitimate claims of environmental justice groups highlight the fact that some Californians are impacted by air pollution more than others. Some of the oldest and dirtiest fossil fuel-based power plants are operated near neighborhoods where minorities and low-income citizens reside. Power plants seldom are built in affluent suburban areas. For that reason, the CPA’s priority of efficiency and renewables serves the interest of environmental justice as well as providing cleaner, cheaper and quicker power for all consumers.

The terrorist attack on America on September 11 revealed how vulnerable the power system is to terrorists. Remote centralized sources of energy pose risks that require a new emphasis on decentralized, local power sources. The CPA is therefore dedicated to

⁹ California Air Resources Board, *2000 State Area Designations Map – Ozone*, 7 February 2002.

advancing the economics and marketing of fuel cells, microturbines and solar PV modules. These technologies can advance efficiency and air quality while moving California toward an energy supply that provides greater security. Toward that end, the CPA is in partnership with the Department of General Services (DGS) in seeking bids to place significant megawatts of these cleaner energy sources at state facilities.

All of the efforts – decentralized power, efficiency and renewables – have job creation and economic development by-products of significant proportions. The equipment and renewable projects purchased or financed by the CPA will preferably be manufactured in California. Conservation investments are more labor intensive than power plants. The CPA investments therefore are designed to add jobs and improve economic progress through advanced energy technologies that will make California an energy leader.

Section 4 reviews the energy market situation and the opportunities for clean resources and provides a basis for the CPA investment plan in Section 5.

Figure 3-2¹⁰



¹⁰ Ibid. Non-attainment areas are air basins in which the concentration of ozone exceeds standards set by the U.S. Environmental Protection Agency.

4. California's Energy Market

California's Electricity Future – An Uncertain Time

Electricity use has grown slowly but steadily in California in recent years, with efforts to use electricity more efficiently paying off continuously. Demand growth averaged 3.2% annually in the 1980s and 0.9% in the 1990s, less than in surrounding states and less than California's economic output or job growth.¹¹ Peak demand reached a high of 53,382 MW in 1999.¹² And with the aggressive conservation efforts and cooler weather in 2001, peak demand dropped to 48,500 MW.

Summer passed without predicted blackouts, and so far this winter gas prices have remained stable and blackouts have not occurred. The outlook seems to have improved. Problems, however, have a habit of reappearing.

The State added about 3,000 MW of new generation capacity last year. Another 2,000 to 3,000 MW is projected to be added this year. Rainfall and snow pack so far this winter have been good. If this continues, hydropower in Northern California and the Northwest will improve significantly over last year. This would bode well for in-state hydro and import opportunities next summer.

On the other hand, the significant conservation results from last summer and fall most likely will diminish as the fear of blackouts grows distant. In addition, new power plant projects are being cancelled or delayed as market prices for power decline.

As the economy rebounds and construction of new power plants tapers off, California will again face the possibility of shortages. This could happen in as little as two to three years. History can and will repeat itself if California does not take action to protect itself by adding capacity and controlling the market structure.

A Discussion of Reserves

In developing this Plan, the CPA focused considerable attention on the question of "how much reserve is needed in today's California energy market?" Discussions with the CEC and CAISO on this issue underscored the wide range of uncertainties and the difficulty of settling on a single number, especially in light of some of the market structure changes being proposed by both the CAISO and the CPUC.

A 7% operating reserve is the minimum required to keep the lights on and comply with reliability criteria. Many analysts suggest that it is significantly below the level of reserve required to maintain competitive markets and reasonable prices. The CAISO has asserted that *dependable* reserves of 14-19% are the minimum levels required to maintain

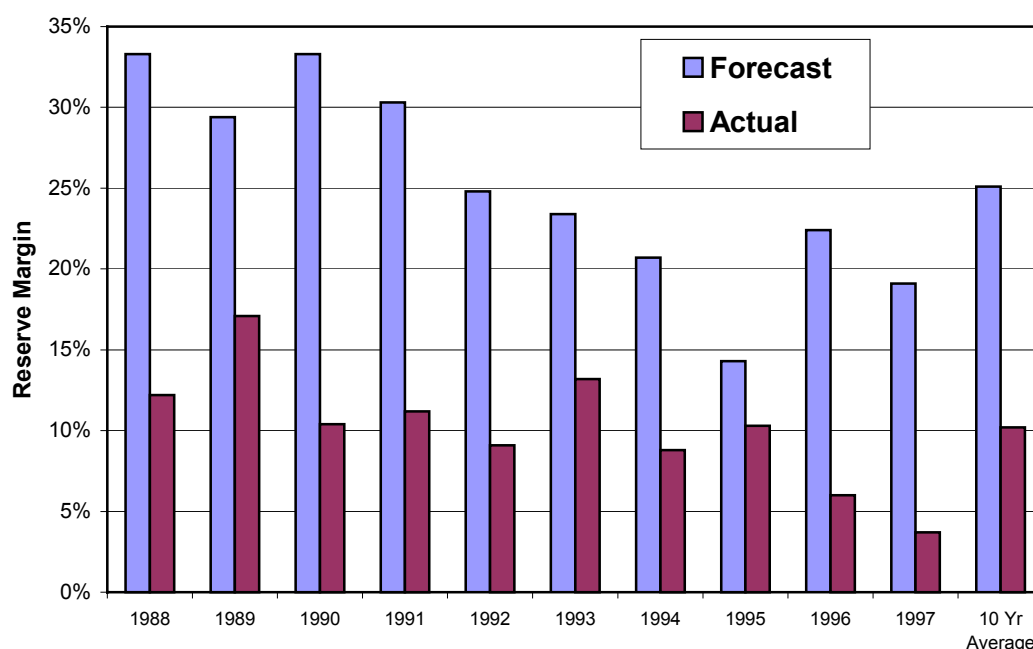
¹¹ CEC, *California Energy Demand, 2000-2010* (99-CEO-1 Technical Report), June 2000.

¹² California Energy Commission (CEC), *Historical Coincident Peak Demand and Operating Reserve*, 7 December 2000.

competitive price levels.¹³ Indeed, in transmission-constrained areas such as Northern California, it is possible that the reserve levels should be even higher.

The uncertainty in California's energy future may be much greater than some expect. The Western U.S. experienced a major deviation from expected available capacity in 2000 – when early summer saw reserves that were 20-30% below the forecasted level. This deficiency played a major role in the high spot prices seen during that time. Unfortunately, this appears to be a regular occurrence, as reserves have typically been 15% below forecasts over the last decade.

Figure 4-1. Reserve Margins – WSCC Forecast vs Actual



Source: Forecast - WSCC Summer Assessment Reports 2000, 2001; Actual – CEC, 2002-2012 Electricity Outlook Report

The CPA concluded that the issue of a reserve target for the state requires more time and interagency analysis. Work on this issue will continue this year. In the interim, this Plan uses 15% as a reserve target, as it is consistent with historic levels and current analysis. However, because this issue is central to the CPA's mission, Appendix 1 provides some brief background on key considerations in determining the appropriate reserve margins.

¹³ Anjali Sheffrin, CAISO, "Reserve Margin Requirements to Promote Workable Competition," November 7, 2001. "Planning reserves" need to be even higher to ensure dependable reserves.

Opportunities for Distributed Generation and Energy Efficiency

This sub-section examines the economically viable opportunities for additional distributed generation and energy efficiency, the current obstacles to achieving these, and the CPA options for both removing obstacles and accelerating the use of energy efficiency and distributed generation.

Distributed Generation

Distributed Generation (DG) is electrical generation, with or without combined thermal energy capture, which is located at the site of end users. Although DG technically can include generation located at utility substations, the CPA is interested in DG more specifically as it functions on the “customer side” of the meter. DG encompasses a range of technological possibilities:

- Conventional engines and small-sized turbines that have a relatively low initial cost and may be attractive to businesses or critical institutions wanting a reliable, on-site primary or back-up power supply.
- Technologies with higher overall efficiencies such as fuel cells or combined heat and power systems that use a conventional generator to generate electricity and also apply the waste heat for on-site thermal requirements, such as process steam, space or water heating.
- On-site renewable energy sources such as ground-source heat pumps, solar photovoltaic (PV) panels, small wind turbines, or fuel cells that use hydrogen or potentially other renewable fuels that chemically produce electricity.

The fuel cells, the high-efficiency combined heat and power and the renewable forms of distributed generation provide added environmental benefits over conventional technologies.

The CPA’s funding and policy recommendations do not include diesel. The reason is straightforward – air quality agencies know that diesel fuels are bad for public health. The CPA will not fund projects that would permit the use of diesels except in the most extreme local emergencies as already permitted.

There is considerable cost-effective potential¹⁴ for high efficiency and renewable distributed generation, albeit for now at a higher first cost than the conventional technologies. The cost-effective potential for combined heat and power (CHP) in the commercial and institutional sectors in California – from a variety of generator types – exceeds 7,000 MW, with estimates that just slightly more than 10% of that potential has been achieved.¹⁵ The CPA has requested bids for volume purchasing of fuel cell and microturbines for CHP to drive down the equipment’s initial costs through larger scale commitments of technology applications.

¹⁴ The number of megawatts of combined heat and power that would be installed by customers fully aware of energy options and prices.

¹⁵ ONSITE SYCOM Energy Corporation, prepared for the U.S. Department of Energy, “The Market and Technical Potential for Combined Heat and Power in the Commercial/Institutional Sector,” January 2000.

Solar hot water heating technologies made their California debut over twenty years ago. Today, photovoltaics (PVs) are poised to generate power during peak demand periods, helping to support the State's peaking power needs with a renewable resource. Several efforts underscore the potential for PVs:

- A study for the Local Government Commission indicates that at a price of \$5,000/kW, some 200 MW of photovoltaics could cost-effectively be installed on municipal buildings and an additional 1,500 MW on schools via an aggregated purchase/installation program.¹⁶
- Municipal utilities such as the Sacramento Municipal Utility District (SMUD) and the Los Angeles Department of Water and Power (LADWP) have active incentive and promotion programs for PV installations throughout their communities. SMUD expects that it could achieve 30-100 MW of photovoltaic power in its service area.¹⁷ LADWP offers incentives for residential and commercial PV systems, with a higher amount for those manufactured in the City of Los Angeles.
- The City of San Francisco passed a solar bond initiative that could finance more than 40 MW of solar PV toward a potential for 500 MW of PV in that city.
- The CPA currently has a request for bids (RFB) open for decentralized solar equipment, seeking to purchase as much as 160 MW over the next five years.

There clearly is significant untapped potential for distributed generation. The challenge is to drive down the cost of manufacturing these technologies via larger-scale production, and to offer financing over the equipment's long lives to produce favorable cash flows. The CPA is committed in this Investment Plan to advance that objective in cooperation with other active partners.

Energy Efficiency and Demand-Responsive Load Reduction

The term "efficiency" refers to investments in buildings, energy-using equipment, and appliances, and is different from "conservation" which more commonly refers to behavioral changes in the use of energy-consuming devices.

The remaining cost-effective potential for additional energy efficiency based on CEC assessments is substantial, amounting to as much as 28,000 GWh and nearly 6,100 MW of peak load capacity. The CEC anticipates that 20,000 GWh of efficiency potential that is cost-effective in the long term would need extra market focus to achieve by the year 2010. This is about 8% of the electricity use in California today.¹⁸ CEC staff estimate an additional 200 MW could be reduced each year, or 1,000 MW over 5 years, through cost-

¹⁶ Christy Herig, National Renewable Energy Laboratory, "Assessing Rooftop Solar-Electric Distributed Energy Resources for the California Local Government Commission," October 2000.

¹⁷ Rafael Friedman, PG&E, "Distributed Generation for California: Costs of Current Equipment" (report to Don Schultz of the ORA, CPUC), undated.

¹⁸ CEC, A Proposal for a New Millennium, The Energy Efficiency Public Goods Charge Report, December 1999, Appendix A, pages 9-10. P400-99-020. (Also referred to by some as "The AB 1105 Report".) CPA calculated the demand impact with a 50% load factor.

effective, high efficiency buildings that beat state standards.¹⁹ Other estimates indicate that cost-effective industrial savings could amount to another 3,576 GWh²⁰ and these would cost the equivalent of only 6 ¢/kWh.²¹ The equivalent energy and demand values for each of these efficiency resources are shown in Table 4-1.

Table 4-1. Energy Efficiency Potential

Efficiency Resources	Generation Savings (GWh/yr)	Peak Capacity Savings (MW)
Existing buildings	20,000	4,566
New buildings	46,380	1,000
Industrial	3,576	544
Total	69,956	6,110

While efficiency measures reduce actual energy consumption, demand-response programs (including time-of-use or “real-time” meters and electric rates) reduce or shift power demand off the peak hour. This provides important reliability value by reducing the chance of outages or price spikes.

Certain demand-response programs can offer a clean, cost-effective way to maintain reserves, compared to a natural gas-fired “peaker” plant. The CEC estimates a potential 3,750 MW available through demand-response programs.²²

Table 4-2. Demand-Response Program Potential

Program	Savings (MW)
CPUC interruptible tariffs and related programs	1,250
Traditional load management (cycling)	500
Revised voluntary demand reduction programs	1,000
<u>Expanded use of real time meters and pricing</u>	<u>1,000</u>
All demand-response sources	3,750

¹⁹ Staff discussion between CEC and CPA, 19 November 2001. CPA used a 50% load factor for energy.

²⁰ Xenergy, *Industrial Energy-Efficiency Potential Estimates for California, Draft Report*, December 2001. CPA applied a 75% load factor to estimate the peak demand impact.

²¹ Interlaboratory Working Group, *Scenarios for a Clean Energy Future*. Oak Ridge, TN, Oak Ridge National Laboratory and Berkeley, CA, Lawrence Berkeley National Laboratory, ORNL/CON-476 and LBNL-44029, November 2000.

²² California Energy Commission, *2002-2012 Electricity Outlook Report, Staff Draft Report* (P700-01-004), November 2001.

A New Concept in Demand-Response

The CPA has been working to facilitate a new design for a statewide demand response program that could provide significant flexibility and demand reduction as early as the summer of 2002. This “Targeted Load Reduction Program” involves an innovative design of networked meters and two-way communications that provides for real-time, dispatchable, verifiable demand reduction at a cost below that of peakers, and with no environmental impacts.

The system would allow the CAISO to dispatch load response in specific geographic areas where and when reliability is at risk. Real time data collection enables immediate validation of load response and would give the CAISO the information it needs to manage centralized reliability. The dispatchability and verifiability features of the program allow it to offset ancillary services costs currently incurred by the DWR through the CAISO. The software and hardware involved would provide the communications infrastructure needed for future real-time pricing programs. Most of the operating costs associated with the program are incurred only when the program is actually needed.

The CPA proposed program recognizes that prior programs were weakened by several factors: they were short term, often confusing and not always feasible for most commercial, industrial and retail customers. A uniform statewide program would reduce customer confusion and marketing costs and would maximize participation by enabling load aggregators and municipal utilities’ customers to participate. It would leverage the value of the CEC real-time meter installations and the Flex Your Power campaign with the CPA’s financing ability for conservation and energy efficiency projects. The program can be implemented to prohibit customer “double dipping” with other utility programs, and imposes little implementation costs on the investor-owned utilities.

This program is an example of the potential for the CPA to facilitate clean energy solutions on a statewide basis working in concert with the CAISO, CEC and CPUC. The CPA will continue to work with these agencies to finalize program design and meet a targeted implementation date later this year.

Role of Government in Energy Efficiency

Considering that efficiency investments can save consumers money, one may ask why special governmental programs are needed to make them happen. Selling energy efficiency, which is not a necessity or luxury, is not the same as selling cars where manufacturers and dealers can combine to offer “zero interest” loans and a hard sell for an item consumers both need and love. The efficiency market has definite obstacles, but these can be overcome as follows:

- Offering integrated and convenient products and services that include financing to make it easy for consumers to participate.
- Sustained, catchy advertisements calling attention to these savings and benefits to the community. As demonstrated last summer, advertising works.

- Broader use of real-time meters can provide critical feedback on the value of reducing energy use during peak times.
- Combinations of rebates or tax credits can make investment more attractive by reducing the higher first costs of efficient buildings, appliances, and equipment.
- Specialized financing at low cost and over a number of years helps utility bill savings exceed load payments, and can overcome any lack of capital to finance these investments.
- Performance guarantees or insurance can address concerns about possible performance risks of innovative equipment and technology.
- Education and financing tools for landlords can help them present the case for financing energy improvements with their tenants, and solve the age-old landlord resistance to making improvements that lower the tenants' utility bills.

Good programs will require the combined efforts of the CPA, CPUC and CEC. The CPA's contribution can be financing; together all can provide an integrated package and deliver tailor-made solutions for each type of customer. The CPA is committed to doing such programs as:

1. ***Financing for a comprehensive package of efficiency & decentralized solar*** measures for home improvements, business renovations, or new building construction.
2. ***Augment limited financing ability of existing programs*** by adding CPA financing (e.g., infusing funds to the CEC's ECAA loans to public agencies to meet pent-up interest in efficiency investments).
3. ***Financing or leasing at longer than typical commercial terms*** to produce monthly costs competitive with business-as-usual equipment and retail energy rates (e.g., for non-residential distributed generation and residential solar).
4. ***Volume procurement*** efforts to drive down the capital cost of newer distributed technologies and real-time meters for small power users by giving manufacturers large-scale markets.
5. ***Performance guarantees and extended service agreements.*** The joint CPA/Department of General Services (DGS) RFB process seeks volume pricing on standard sets of high quality distributed generation technology. The bids require five-year performance warranties and service agreements; a longer-term performance guarantee pooled-risk arrangement can increase the likely investment in such technologies.

Achieving Opportunities for Centralized Renewable Energy Development

The term "Centralized Renewable Energy" is used to describe large renewable projects installed at a centralized location where there is a high concentration of the renewable resource (e.g., wind, geothermal, biomass, solar). Many sources of centralized renewable power are competitive with the 8 cents per kilowatt-hour (¢/kWh) that the CEC forecasts will be the generation component of the retail rate for customers of the investor-owned

utilities over the next decade. Indeed a recent study by the Electric Power Research Institute projected that by the end of the decade an additional 4,400 MW of centralized renewable power could be economically available in California at a price of 6.9 ¢/kWh or 8,200 MW at 9.1 ¢/kWh under normal market forces.²³

There are, at present, two major impediments to centralized renewable projects. The first is the lack of a wholesale market, either through long-term bilateral contracts or active bidding in short-term markets. The second is the high initial capital cost compared to conventional power plants.

The role the CPA can play is to provide lower cost financing for the capital-intensive projects. This should provide the impetus for developing these resources in a long-term power market. There is no shortage of renewable generation projects for the CPA to consider. The CPA has already received proposals for 5,640 MW of grid-connected renewable power. It has signed Letters of Intent with developers for 2,400 MW of this amount and is performing due diligence on those projects.

Key actions that the CPA can take to facilitate the growth of this market are as follows:

1. At present the current market structure fails to satisfy consumer interest in renewable power. The State can lead by example. One key action that the CPA can take for now is to act as a broker or wholesale intermediary to secure power from new and selected existing renewable projects.
2. Legislative or CPUC action is needed to require that utilities and other load serving entities supply a certain percentage of renewables to all their customers. Such legislation is pending. The CPA could act as a broker of long-term contracts or a wholesale intermediary between the renewable power plant projects and load serving entities that would purchase and supply the power. The CPA has signed Letters of Intent with many projects and is now performing due diligence on them. Contracts can and should be entered into with the DWR and should be assignable to the investor-owned utilities when their credit is restored.
3. Legislation or CPUC rulings could require utilities to offer green pricing programs to their customers. The CPA could act as the broker or supplier of the renewable power for this program.

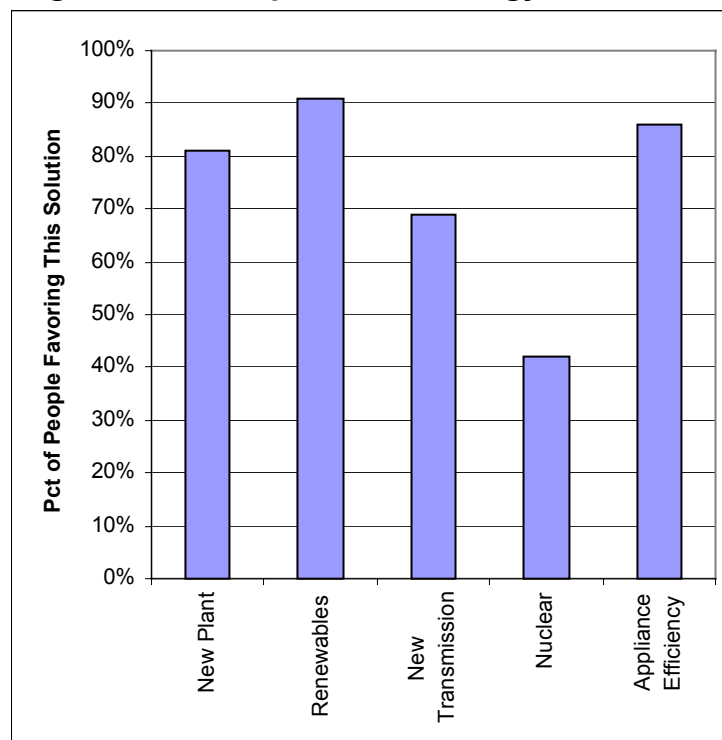
Public Preferences for Meeting Electricity Needs

Conservation and renewables are needed for several policy reasons – lower costs, cleaner air, more jobs, and shorter lead times. It is also of interest that the people recognize the importance of these attributes of clean energy. Gallup polls throughout the past year indicate that a majority of people (81%) favors investing in new power plants to deal with projected energy shortages. In addition, the Gallup polls indicate that a larger number

²³ Electric Power Research Institute, “California Renewable Technology Market and Benefits Assessment, Final Report to the California Energy Commission,” November 2001.

(91%) favor an investment in renewable sources of energy such as solar, wind and fuel cells rather than conventional sources (at 42%).²⁴ Mandated energy efficiency (such as more efficient appliances, at 85%) and increased transmission lines (69%) scored higher in May during the peak of energy shortage concerns. These polls indicate that people prefer efficiency and especially renewables as ways to address the energy challenges.

Figure 4-2. Gallup Polls on Energy Preferences



A number of California's fossil fuel power plants are over 30 years old and are very inefficient and therefore highly polluting, even with controls. They will need to be replaced over the next decade. The issue is whether they will be replaced by renewables and demand-side projects or still more gas-fired plants.

Based on public preferences, the answer is to replace these old natural gas-fired plants with geothermal, wind, solar and biomass. If only 10% of these natural gas-fired plants are closed down, it will create a 3,000 MW gap for renewable energy which is within CPA's goal for the next four years.

Reducing demand through energy efficiency is a highly cost-effective strategy. Nationally over the past five years, utility ratepayer programs have saved 25,000 to 30,000 MW annually, the equivalent of 100 large power plants, through energy efficiency

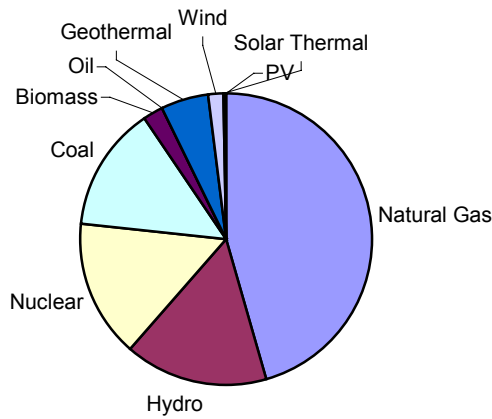
²⁴ Gallup News Service, "Americans Favor Alternative Energy Methods to Solve Shortages," 27 November 2001.

programs. These programs averaged 2.8¢/kWh, a cost that is less than that of most new power plants.²⁵

The energy resource mix of today stands in sharp contrast to public preferences. As Figure 4-3 illustrates, fossil fuels and nuclear supply 75% of California's energy today. An additional 16% comes from hydroelectric power, most of which is from large dams. Hydroelectric power brings with it a much larger share of the risk associated with traditional generation because of the annual uncertainty of the water availability. This uncertainty can have significant consequences for the capacity and energy available between one year and the next. Another 2% comes from biomass, much of which is from direct combustion waste-to-energy plants. Only 7% of the energy comes from the cleanest renewable sources – geothermal, wind, and solar energy.

New generation that has come online since 1999 or is currently under construction is 96% natural gas, 2% wind, 1.2% geothermal, 0.6% biomass, and 0.1% hydro. Continuing in this direction will further increase risk and insecurity in the California electricity market, contrary to the preferences and best interests of Californians.

Figure 4-3. Total 1999 California Electricity Supply by Fuel Type



Source: California Energy Commission

The challenge to the energy policy makers is finding a way to meet public preferences for renewable energy and efficiency in today's uncertain market situation. Moreover, diversifying the energy mix reduces dependence on natural gas and provides a greater hedge to volatile prices from natural gas-fired power plants and greater security from terrorist activities. With this Investment Plan, the CPA commits itself to meeting that challenge with the necessary help of the load serving entities and other energy agencies and suppliers.

²⁵ Energy Foundation, *National Energy Policy Factsheet: Utility Energy Efficiency Programs*, downloaded from www.ef.org/national/FactSheetUtility.cfm, 28 September 2001.

Natural Gas Needs

Recently the CPUC completed a study of the natural gas infrastructure in California. The CPUC concluded “California’s natural gas transportation and storage system ... is adequate to provide seasonally reliable amounts of competitively priced natural gas to residential, commercial, industrial, and electric generation customers. Therefore, the CPUC recommends that the Power Authority should not finance any new natural gas projects.”²⁶

Summary

The current mix of resources does not reflect either the State’s policy needs or public preferences for renewable power and conservation. A number of studies confirm that there is plenty of conservation, load management/demand responsiveness, distributed generation and centralized renewables that are cost-effective compared to the cost of conventional generation for the next decade. Key barriers to additional development of these resources can be overcome with focused programs, bulk purchasing of technology, and attractive financing. The CPA, with the help of the CPUC and the CEC, proposes to galvanize such an effort.

²⁶ California Public Utilities Commission, Energy Division and Strategic Planning Division, *2002-2006 Natural Gas Infrastructure Outlook*, November, 2001.

5. Energy Resource Investment Portfolio

Previous sections of the Plan noted that:

- 3,500 MW of additional capacity, in renewable and decentralized capacity, has value for reliability, stability and security in California's uncertain energy future – much of it is also flexible so that it can be reduced or increased quickly at little cost;
- Californians prefer clean energy to meet their electricity needs;
- The cost-effective potential exists for 15,000-20,000 MW of clean energy; and,
- CPA can package financing and value-added services itself and with others to achieve clean energy.

In this section the CPA outlines a strategy for an Investment Portfolio that accomplishes this 3,500 MW goal and provides a foundation for expanding clean resources to 8,000 MW. In Section 6 the CPA evaluates the costs and benefits – the economic and environmental impacts – of this Portfolio. In Section 7 the CPA presents a summary financial plan for this Portfolio.

The CPA's Investment Portfolio provides 3,500 MW of clean resources to meet the public's preferences for clean energy and to ensure adequate reserves by 2006. This Portfolio was selected using the following criteria:

- *Clean resource* – either uses non-fossil fuel (e.g., efficiency, photovoltaics), uses it much more efficiently (e.g., combined heat and power displaces heat or steam from a gas boiler or heater as well as producing electricity), is a much cleaner application where combustion technology is necessary (e.g., low emitting peaker to replace old unit where some power plant is necessary for local reliability reasons) or is an application that provides significant other environmental benefits (e.g., biomass that extends the life of landfills or displaces open burning of materials).
- *Cost-benefit* – provides significant, economic and environmental benefits for the investment.
- *Cost-effective* – provides significant energy or capacity for the investment,
- *Capacity-energy balance* – provides a balance of resources that are baseload in nature (e.g., wind, geothermal, biomass) with peaking resources (e.g., demand reserve, solar) so that over the long term the Portfolio generally matches the pattern of customer demand and in the near term matches the needs of California given the utility retained generation, DWR contracts and other available resources.
- *Foundation for leverage* – provides a critical mass of market experience and programs so that the costs of newer clean technologies can be lowered to the point that non-CPA dollars can be invested to accelerate the use of those technologies.
- *Institutionally feasible* – can be financed and implemented without legislative or regulatory policy change.

Table 5-1. CPA 2006 Resource Mix

Resource Type	Capacity (MW)	Investment (\$million)
Customer Site		
Efficiency*	500	\$ 1,000
Demand Reserves	1,900	\$ 93
Combined Heat & Power	150	\$ 305
Photovoltaic	75	\$ 450
Fuel Cell	50	\$ 185
Sub-total	2,675	\$ 2,033
Centralized Resources		
Wind**	1,000	\$ 1,300
Geothermal	150	\$ 300
Biomass -- Existing	150	\$ -
Biomass -- New	50	\$ 100
Landfill Gas	25	\$ 50
Solar Thermal	50	\$ 125
Peaker-- Local Reliability	100	\$ 65
Peaker -- Renewable	100	\$ 100
Sub-total (Installed Capacity)	1,625	
Sub-total (Firm Capacity)	825	\$ 2,040
Total	3,500	\$ 4,073

* Efficiency is limited to a \$1 billion dollar investment by the CPA statute.

** Dependable capacity of wind is 20% of its installed capacity.

Customer Site Resources contribute to all 3 program prongs:

- 1,900 MW to Strategic Reserves,
- 625 MW to Greening Public Buildings, and
- 150 MW to Customer Efficiency & Dist. Gen. under Clean Energy Financing.

The CPA is currently targeting the resource mix illustrated in the table above as meeting these criteria. Demand reserves, efficiency, and wind provide most of the capacity and energy to provide a strong, cost-effective base for the clean portfolio. However, there is a reasonable contribution from a cross-section of other newer clean technologies to further their market development and cost reduction. The CPA intends that its commitments can help these technologies grow 2-5 times bigger leveraging other financing.

Capacity Energy Balance

A simple portfolio example:

Wind plants produce a lot of energy throughout the year, but there is uncertainty as to when it will come. In contrast, demand reserves – where end users significantly reduce power during critical conditions – can be predictable and controllable, working best when used a limited number of hours per year. Combining wind and demand reserves in one portfolio yields a clean mix that provides a balance of energy and dependable capacity.

To achieve this resource mix, the CPA has organized the implementation of its Portfolio along three prongs:

1. **Clean Energy Financing** – using the CPA's capability to facilitate financing to accelerate the use of clean resources – renewable energy and energy efficiency – to provide 775 MW by 2006.
2. **Strategic Reserves** – targeting clean resources to help meet the peak demand and system reserve needs to provide 2,100 MW by 2006.

3. **Greening Public Buildings** – targeting clean resources (efficiency and on-site generation) to provide 625 MW to meet about 20% of the estimated 3,300 MW electricity demand of public buildings by 2006 – federal, state and local governments and schools.

Table 5-2. CPA Portfolio

	2002-03			By 2006		
	Total Capital (\$million)	Annual Generation (GWh)	Peak Capacity (MW)	Total Capital (\$million)	Annual Generation (GWh)	Peak Capacity (MW)
Clean Energy Financing						
New Grid Renewables						
Wind*	\$ 1,300	2,628	1,000	\$ 1,300	2,628	1,000
Other	523	1,473	250	575	1,621	275
Existing Renewables	-	920	150	-	920	150
Customer Efficiency & Dist Generation	125	219	50	376	283	150
Sub-Total	\$ 1,948	5,240	650	\$ 2,251	5,451	775
Strategic Reserves						
Local Reliability	65	44	100	65	44	100
Greening the Peak						
- Demand Reserves**	49	88	1,000	93	166	1,900
- Renewable Peaker	50	44	50	100	88	100
Safety Net***						
Sub-Total	\$ 164	175	1,150	\$ 258	298	2,100
Greening Public Buildings						
State	75	158	30	501	1,051	200
Local				1,064	2,234	425
Sub-Total	\$ 75	158	30	\$ 1,565	3,285	625
Total	\$ 2,187	5,573	1,830 *	\$ 4,073	9,034	3,500 *

* Dependable capacity of wind when needed is 20% of its installed capacity.

** These resources particularly can be reduced or increased at little cost in response to load levels in future years.

*** Since these are resources already expected to occur, but that the CPA may need to assist, no incremental MWs or dollars are included here for the “safety net” resources.

Together these three prongs, as shown in Table 5-2, are planned to deliver 3,500 MW of clean resources at a cost of \$4.1 billion CPA financing. Because of near-term uncertainties in power supply, the CPA expects to supply half of that capacity (1,830 MW firm capacity) using about half of the financing (\$2.2 billion) by the end of 2003. Consistent with the CPA’s mandate, over half (2,100 MW by 2006) of the capacity is in strategic reserves that provide mostly capacity but little energy.²⁷ However, fulfilling the CPA’s other mandate for clean resources, the other half of CPA’s Portfolio provides

²⁷ These resources have a combined capacity factor of 1.7%, which is consistent with the capacity factor the CEC forecasts for peakers in the foreseeable future.

significant clean energy and the associated environmental and economic development benefits. The total clean energy supplied (9,034 GWh) is a little over half²⁸ of California's remaining need after utility generation and the DWR contracts (the "residual net short" need) during the next 4-5 years and a much smaller portion in future years.

Clean Energy Financing

In its role, the CPA will bring together financing and technology procurement as two key strategies for clean resources. The CPA's contribution is not only its own bond financing, but also its ability to facilitate access to other funds and to act as an appropriate broker to bring together buyers and seller in a marketplace for cost-effective large-scale, clean energy technologies.

New grid-connected renewables. Within the next two years, the CPA intends to facilitate the financing and/or procurement of approximately 1,250 MW installed capacity (or 450 MW of firm capacity)²⁹ of new, grid-connected renewable generation projects. These projects will be selected from two candidate pools:

One pool will be those proposals received by the CPA in conjunction with its own ongoing renewable generation solicitation process. To date, the CPA has received proposals for renewable projects representing a total capacity of 5,640 MW, of which 2,400 MW has been incorporated into the CPA's initial due diligence process through signed Letters of Intent. The resource types composing the Authority's list of signed Letter of Intent projects include: wind (76%), geothermal (13%), biofuel (10%) and landfill gas (1%).

A second pool of renewable projects will be those that have successfully competed in the CEC's New Renewable Resources Account auction process. Since the program's inception the CEC has conducted three auctions that have resulted in 1,300 MW of renewable projects being incorporated into the program. The distribution of resource types within the CEC's program (75% wind, 12% geothermal, 6% landfill gas, 6% other) is similar to the distribution of Letter of Intent-signed projects at the CPA.

Existing grid-connected renewables in 2002. There are a variety of renewable generation projects already constructed and, in most cases, which have previously provided power to the grid. Most have long-term qualifying facility (QF) contracts with the investor-owned utilities at about 7.8 ¢/kWh. However, there are about 150 MW of existing biomass projects without contracts that are on the verge of being shut down because they are uneconomic at today's spot prices of 3-4 ¢/kWh. A loss of these existing projects would be in direct contradiction to California's policy

²⁸ DWR information being developed for Rate Bond Prospectus projects the residual net short position to be between 15,000 and 20,000 GWh for the next 4-5 years and then to dramatically increase. Since CPA's overall Portfolio has more peaking capacity than baseload capacity, CPA's Portfolio is expected especially to help meet the residual net short need.

²⁹ In its planning, the CAISO deems wind power plants to provide firm capacity equal to 20% of its maximum capacity – due to the variations in wind supply. Other renewables have differing capacity factors.

supporting renewable energy development, and would have direct and significant environmental impacts to the State. In the absence of these projects, agricultural and wood waste would either be disposed of in California's already-limited landfill space or openly burned in areas of air quality non-attainment. Absent a regulated electric generation industry, there is no market mechanism for valuing these societal benefits. As a consequence, the cost to society of these facilities is actually higher when they do not operate.

The CPA can play a significant role in ending the boom-and-bust history of these valuable renewable generation resources, either through the low-cost financing of projects or their outright ownership. The CPA has already brokered a temporary three-month contract between the DWR and a number of biomass generators until a more permanent solution can be developed. Without this effort these biomass power plants would have shut down at the end of last year. If a permanent market or publicly-funded mechanism is not found which rewards these projects for their public good as well as their electricity product, California will move one step backward in trying to attain the Governor's renewable generation goals for 2010 and beyond.

Customer Efficiency & Distributed Generation. The keys to increasing market adoption of cost-effective efficiency and distributed generation technologies rest on three principles – favorable economics, minimum technology risk, and convenient turn-key delivery. Examples of solutions for selected audiences include:

- a. *Commercial-industrial efficiency improvements.* Some commercial and institutional end users need a loan and repayment mechanism tied to their annual operating budgets. Such a loan could substantially expand efficiency investments.
- b. *Technology performance guarantees.* The CPA is exploring performance guarantees or warranties for newer technologies, to reduce customers' perceived risk. These guarantees might be financed as part of the technology purchase.
- c. *Residential home improvement loans.* There are several methods for the CPA, working with the CPUC and CEC, to leverage expanded financing of home energy improvements. These include:
 - FNMA interest in working with California to significantly expand loan activities under its current program.
 - The CPA might seek a partner to make secured residential loans for purposes, amounts, and/or credit criteria outside the FNMA program.
 - A solar water heater or PV bulk purchasing, turnkey installation, and/or loan program is a possibility.
 - Other opportunities might involve public housing agencies and new homebuilders who want to better California Code of Regulations Title 24 energy standards.
- d. *Customer financing repayment via utility bills.* The CPA is exploring an option for customers to repay their loans via utility bills. This will require the cooperation of distribution utilities and their regulatory bodies (PUC or public power boards).
- e. *Financing clean technology in manufacturing via industrial development bonds.* The CPA hopes to establish a partnership to offer industrial development bonds

- for a) the purchase and installation in manufacturing companies of renewable energy systems, energy-efficient equipment, or clean distributed generation systems, or b) the manufacture of renewable energy components or systems.
- f. *Cities and community development organizations*, including the Native American community, are candidates for partnering with the CPA to provide efficiency and distributed generation projects.

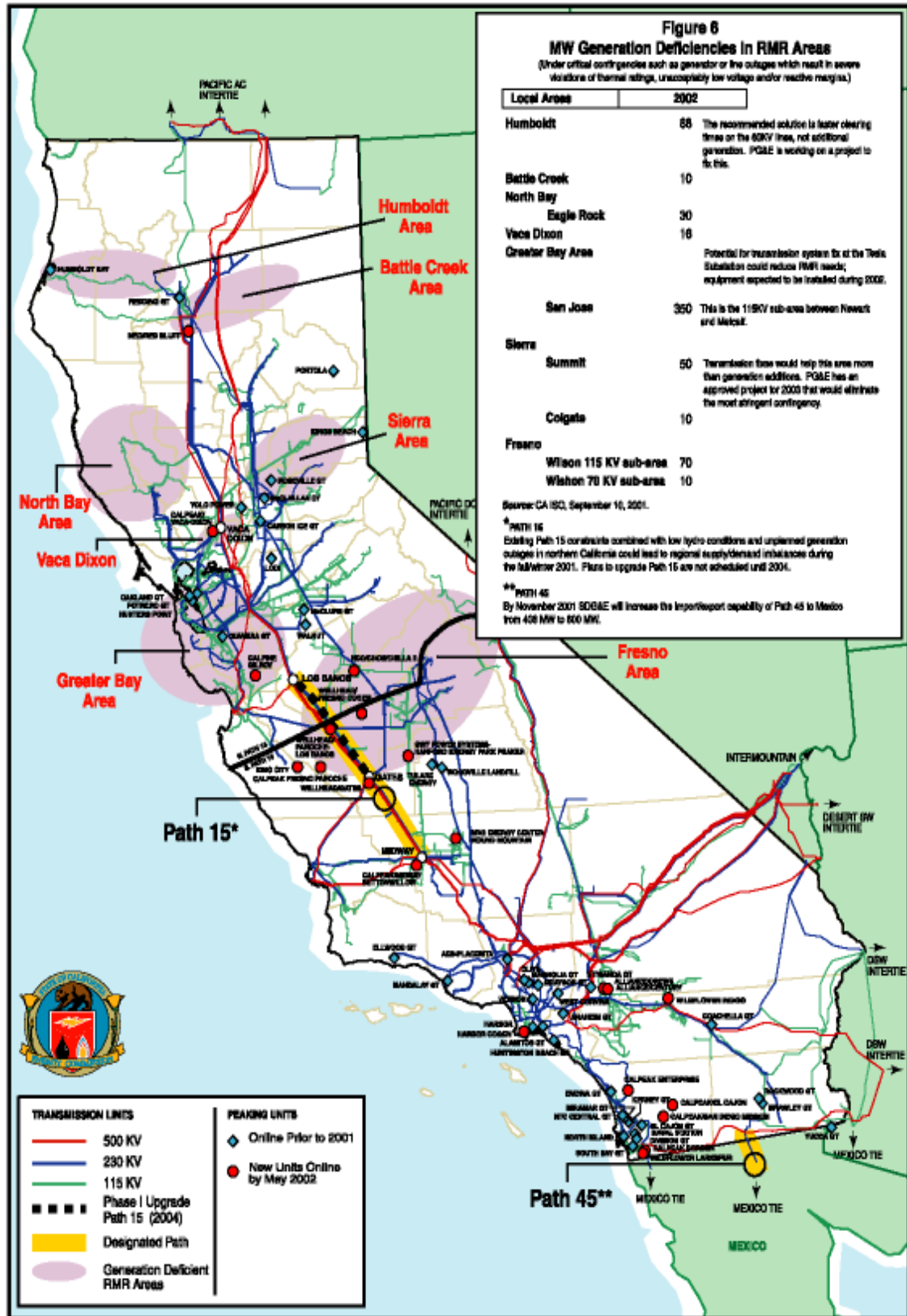
Strategic Reserves

Maintaining adequate capacity reserve margins is a major concern of the CPA. Many power plants that are used mainly to meet peak demands, provide reserves, or maintain statewide or local reliability often emit air pollutants such as NO_x at a higher rate than other plants. The focus here is providing resources to supplement or replace dirty gas plants for reserve capacity:

Local Reliability. The CPA plans to target resources in a number of areas needing local reliability support. Figure 5-1 shows the need for local reliability enhancement. Both the CAISO and CEC highlight the San Francisco – San Jose corridor as the area needing the greatest support. Thus, the CPA's initial local reliability plan targets several immediate projects in the San Francisco-San Jose corridor to enhance local reliability during peak periods with cleaner generation alternatives:

- *A saturation approach to load management and efficiency*, coordinated with local organizations and local electric utilities for the marketing of utility technical assistance and rebate programs with CPA-arranged financing. This alternative to localized outages can enable businesses to select a higher reliability rate option. CPA financing can pilot private sector efficiency and distributed generation programs for subsequent statewide use.
- *Photovoltaic Partnership with the City of San Francisco.* San Francisco voters passed a public referendum to spur solar PV investments. The CPA and the City can combine resources to commercialize solar power. Collaboration may include the CPA's bulk procurement program and sharing experiences with implementation mechanisms.
- *A small peaking power plant located on the San Francisco peninsula.* To be constructed at a site that has received all necessary environmental permits and approved by the CEC, this 50 MW facility will provide increased grid reliability where it is desperately needed, and do so by the summer of 2002. Finally, the CPA is also jointly developing another clean and efficient power plant project with the City of San Francisco. This 57 MW facility, tentatively scheduled to be on-line by summer 2003, will further improve the local reliability of San Francisco's electric distribution system and allow for reduced use of older, dirtier plants in the San Francisco peninsula.

Figure 5-1. Areas of Generation Deficiency



Greening the Peak. Since peaking power plants are often the dirtiest, a special effort is made to provide clean peaking alternatives. These include:

- *Demand Reserves.* As discussed in Section 4, the CPA is developing a program that is capable of delivering 1,000 MW of peak demand reduction “on call” during 2002-2003 – and up to 1,900 MW by 2006. The program will offer significant advancements over past programs and it incorporates new technologies that permit direct, real-time and geographically-targeted access to significant amounts of load. With this approach, the CPA, DWR and CAISO are, in effect, creating a strategic reserve of “negawatts” to provide critical peak load insurance against the adverse impacts of insufficient power supplies.

By incorporating low-cost, automated meter communication technologies, peak load reductions can be activated in response to either a statewide emergency or selected localized problems created by transmission congestion. Furthermore, because a customer’s action to reduce demand can be monitored on a real-time basis, verification of the demand reduction is essentially instantaneous, thereby greatly reducing the currently complex settlements process for making payments to program participants.

The CPA also plans to work with the CPUC and CEC to bring real-time metering and energy consumption data to smaller energy users to manually control their energy demand where automatic communication and control equipment is not yet practical. The CPA issued a solicitation for technology and delivery ideas for such metering and is in the process of reviewing proposals.

- *Renewable Peakers.* Early in its program activities the Authority solicited proposals for developing new renewable generation projects. Among the projects submitted were a few that are both 100% renewable and operate with all of the characteristics of a peaking power plant. Traditionally, renewable power plants have been unable to provide power for the entire peak period (fueled solely by a renewable source), or deliver the power within 10 minutes of a dispatch order. However, peaker projects designed to operate on biofuel or biogas, both of which are either manufactured or stored on site, can satisfy these criteria. The CPA is confident that at least 100 megawatts of renewable peaking capacity can be developed during 2002, and is signing Letters of Intent with project developers to achieve this goal.

Safety Net. As mentioned earlier, the reserve gap to be filled by clean energy presumes the completion of at least 3,000-6,000 MW of gas-fired plants currently in the pipeline. If there appears to be major withdrawal of combined cycle construction, the CPA can step in with contracts and financing to insure that at least the minimum necessary amount is built. In addition, there may be certain key projects critical for local reliability which should be re-powered with a cleaner combustion technology for environmental and health benefits. During the next year, the CPA will be evaluating with the other state agencies,

such as the CEC and the Air Resources Board, the status of plants under construction and the candidates for re-powering to determine what additional steps the CPA should take in providing a safety net for plants critically needed for reliability.

Greening Public Buildings

The CPA, at the encouragement of the Governor, wants to help the public sector lead the way in using clean energy. An Interagency Task Force estimates that the public sector – state and local government plus schools – uses nearly 2,500 MW of peak demand and 12,500 GWh of electricity. This is about 5% of the electricity use in the state. The CPA and many public agencies find that a Clean Energy program can be developed that uses a two-pronged strategy of price discounts via large-scale purchases over many years, plus tax-exempt financing. Together these can gain lasting control over public agency electricity bills.

In this program, a mix of energy efficiency, load management, and distributed resources will be used to meet a quarter of these electricity needs, with over half of the supply expected to come from energy efficiency. The capital requirement to supply 625 MW of new “demand-side capacity” in public buildings is expected to be \$1.7 billion. The CPA is initiating a program that allows it to coordinate the bulk procurement of distributed energy generation technologies (e.g., fuel cells, combined heat and power, and decentralized solar) to lower their cost for all public agencies, while blending financing from a number of sources, including its bonding authority, to make the new technologies competitive with traditional purchased power.

1. State Facilities

The CPA is working closely with the state agencies whose facilities account for most of the State’s energy consumption to identify the best opportunities for clean technology deployment. Participating agencies include DGS, University of California, and the California State University System and will expand shortly to include Community Colleges and the Department of Corrections. Activities include identifying an inventory of host sites, developing models for technology packages and their economics, and promoting the availability of bulk purchase pricing of the technologies.

2. Local Facilities

Local agencies comprising city and county buildings, public schools, and water & wastewater agencies together have twice the energy demand and consumption of State facilities. The CPA is working with the CEC, in consultation with local public agencies, to design an enhanced CEC loan program with greater lending resources, larger loans, and broader technologies. In-depth meetings are planned to fine-tune the program and expand lending activities up to \$50 million per year, versus the \$10 million per year possible with the CEC’s existing portfolio. Regardless of financing choices, collaboration is underway through the Governor’s Office of Planning and Research with Local Government Partnership member organizations representing all local agencies to publicize the upcoming bulk procurement prices and performance warranties for clean energy technology.

3. Federal Facilities

Recently the Federal Energy Management Program (FEMP) has expressed an interest in working with CPA in greening some of the 800 MW of load in federal buildings as well. The CPA welcomes that offer and will work with FEMP to develop a program that appropriately targets federal facilities.

Financing Mechanisms

To achieve this Portfolio, several types of financing mechanisms will be used, as described in the chart below. Customer site measures (e.g., efficiency, load management and distributed generation) going to one or more public entities can be large enough to support the special issuance of tax-exempt bonds that will be secured against repayment directly by such entities. On the other hand, financing provided to businesses and consumers will come as part of a loan pool supported by taxable bonds. Some commercial-industrial users have expressed interest in paying such loans through their utility bills. They like the connection of the bill to the source of savings and they believe the bill repayment mechanism will reduce the competition for internal funds at higher interest rates. For the loan pools, the CPA will often look for co-financing partners who can also provide taxable financing.

Table 5-3. CPA Financing and Repayment Mechanisms

Resource Type	Borrower	Financing Mechanism	Repayment
On-Site efficiency load management distributed generation	Public Entities	Tax-Exempt Bonds	Direct
	State Gov't		
	Local Gov't Schools		
Centralized	Businesses/ Consumers	Loan Pool	Direct or Utility Bill
		-- CPA taxable bonds	
		Co-financers funds	Direct or Utility Bill
	Municipalities	Tax-Exempt Bonds	Direct
	Generators	Taxable Bonds	Direct
	Investor-Owned Utilities (when credit worthy)	Taxable Bonds	Direct
	Businesses/ Consumers	Tax-exempt Bonds Taxable Bonds	Utility bill charge

For centralized resources (wind, geothermal, local peakers, etc), several possible mechanisms exist. Centralized resources that are being supplied to municipalities can be financed with tax-exempt bonds secured directly by the municipalities' repayment.

Similarly, taxable bonds can be issued against projects secured by generators or by long-term contracts with the investor-owned utilities.

Any financing provided by the CPA will address mechanisms to assure quality and safety. For example, the CPA envisions a prospective certification process and training, in conjunction with organized labor, for potential installers of equipment. The CPA financed projects also will also incorporate SB 2296 Design/Build requirements.

For all projects and programs, the CPA will secure expert review on critical issues. These may be technical, financial, or legal in nature, and will encompass a range of methods including paid expert review, voluntary technical panels, and consultative processes with prospective clients and stakeholders.

In summary, the CPA has identified a portfolio of clean energy options that can meet its 3,500 MW goal. This portfolio also provides a base from which other financing can be leveraged to provide 8,000 MW or more of clean energy supply. The next section assesses the benefits and costs of the CPA Portfolio.

6. Benefits and Costs of the CPA Portfolio

The previous section defined the CPA's Portfolio for supplying 3,500 MW of clean energy. This section reviews the benefits and costs of the CPA Portfolio. This review occurs in three parts:

1. The benefits and costs as reflected in the impacts of the CPA Portfolio versus Business As Usual.
2. Three alternate cost-effectiveness perspectives – levelized costs per kWh, rate impacts, and net present value.
3. Mechanisms by which the CPA will ensure its projects maintain an attractive benefit-cost proposition for the people of California.

1. Benefit and Cost Impacts of CPA's Portfolio

The CPA's mandate directed the CPA to consider not only costs, but also other impacts. A balanced and reliable CPA power resource portfolio must also include:

- Protecting against potential volatility and uncertainties in the market – from a variety of factors including ownership patterns, management practices, fuel delivery, capital markets, and other competitive forces.
- Addressing the need to increase fuel diversity in the face of a historic heavy reliance on natural gas, made even worse in the past two years as 96% of all new generation is fueled by natural gas.
- Recognizing economic, environmental, and social/public health impacts of energy resource decisions not currently captured in direct costs of some technology, fuel, or locational choices.
- Increasing reserve margins so that both load serving entities and direct access customers are not held hostage by narrowly competitive markets and the associated tendency for price spikes.
- Resolving localized resource constraints with appropriate resource additions – whether generation, transmission, and/or demand management strategies.

These considerations need explicit consideration in any resource planning environment. California's current power investment market does not fully capture all these. Thus, the CPA's public mandate is not only to furnish "affordable power" but also to ensure reliability, sufficient power resources, stability, public health, and the capture of efficiency and renewable energy resources. These mandates dictate investment and brokering of a balanced portfolio of resources that certainly considers price, but also weighs these many other important considerations. Therefore, the CPA's main benefit-cost analysis explicitly identifies the impacts of its Portfolio versus Business As Usual.

Table 6-1 shows that the CPA Portfolio provides significant environmental, economic, and security benefits over twenty years compared to a Business As Usual Portfolio, which largely uses gas-fired technologies for incremental capacity.³⁰ There is a

³⁰ The methodology and data sources used in this analysis are described in Appendix 3, "Benefit Cost Analysis: Methodology and Data." Briefly, the Business As Usual case assumed the addition of gas technologies to match the 3,500 MW and 9,034 GWh of output from the CPA Portfolio. In particular, the

significant reduction in greenhouse gases (CO₂) – equivalent to taking one million cars³¹ off the road.³² The CPA Portfolio also enhances security by reducing dependence on one fuel and by decentralizing the resource base – including significant efficiency and distributed generation at the customer sites.

Table 6-1. Twenty-Year Impacts of CPA Portfolio

	Business As Usual Portfolio	CPA Portfolio	CPA Impact
Investment (\$million)	\$ 2,583	\$ 4,073	\$ (1,490)
Environmental Impacts			
NOx (thousand tons)	6	5	1
CO2 (thousand tons)	74,593	13,051	61,542
Security			
Resource Diversity	No	Yes	Increased
Decentralized	No	Mostly	Increased
Economic Development			
Jobs	968	4,528	3,559
Tax Revenues (\$million)	\$ 426	\$ 746	\$ 320
Gas Purchases (\$million)	\$ (4,080)	\$ (391)	\$ 3,689
Total Effect			
Out-of-state manufacturing	\$ (1,763)	\$ 8,900	\$ 10,663
In-state manufacturing		\$ 17,800	\$ 19,563

Because conservation and renewable technologies are more labor intensive than conventional generation, there are about 4,000 more jobs created with the CPA Portfolio.³³ In addition, most conservation and renewable technologies are usually characterized by higher fixed costs and little or no fuel costs. This has two impacts – first, it increases the tax revenue base and second, it reduces the out-of-state natural gas purchases. The CPA Portfolio reduces out-of-state natural gas purchases by \$4 billion.

The combined economic development impact of creating jobs, tax revenues and in-state spending provides \$9 billion of benefit to Californians. This is in stark contrast to the Business As Usual Portfolio that has a net \$2 billion negative impact from the natural gas purchases. Thus, the CPA Portfolio provides a net \$11 billion economic development

Business As Usual Portfolio assumes 2,268 MW of new combustion turbines at a capacity factor of 2% plus 1,232 MW of new combined cycles at 80% capacity factor. Most of the input data for the CPA Portfolio came from the report by the Electric Power Research Institute, “California Renewable Technology Market and Benefits Assessment,” November 2001. This was supplemented with data from the CEC, Air Resources Board and bids received by CPA.

³¹ Commissioner Art Rosenfeld, CEC, personal communication, 13 January 2002.

³² Since the CPA Portfolio includes efficient use of some carbon-based fuels – mainly biomass/biogas, plus combined heat and power and fuel cells -- there are some air emissions from this Portfolio.

³³ The jobs and tax revenue is based on information from EPRI, for the CEC, “California Renewable Technology Market and Benefits Assessment,” November 2001.

benefit over the Business As Usual Portfolio.³⁴ Moreover, to the extent that the CPA Portfolio technologies are manufactured in California, the economic development impact could double—potentially yielding an incremental benefit near \$20 billion over the Business As Usual path.

The initial cost of the CPA Portfolio is expected to be \$4.1 billion. This looks attractive next to the Business As Usual resource mix. The Business As Usual scenario will have lower initial costs – the initial cost of 3,500 MW of combustion turbine and combined cycle units could be as low as \$1.5 billion. Moreover, as discussed above, the CPA Portfolio provides the benefit of long-term, low-cost financing, and significant economic development benefits.

2. Cost-Effectiveness

There is a legitimate concern voiced by some energy market observers – “Would the clean growth projects the CPA proposes to sustain a competitive power market result in consumers paying more for the electricity they need?” This concern understandably stems from the fact that some renewable energy has higher initial capital costs, and that even when renewable fuel is free, power produced by new gas-fired power plants at today's relatively low price of natural gas could still look cheaper. To address these concerns, three additional perspectives on cost-effectiveness are provided – levelized cost, rate impact and Net Present Value.

Levelized Costs

Levelized costs is a total cost per unit of output, such as cents per kWh, that amortizes the fixed costs over the life of the equipment. It is one simple way to compare the cost-effectiveness of technologies. Table 6-2 summarizes the levelized cost in cents per kWh of various conventional and renewable technologies.

Historically power plants were used primarily for two purposes:

- To provide a baseload level of energy around the clock, and,
- To provide energy primarily during the peak times.

The clean energy technologies are displayed in the table along with corresponding conventional technologies for these two categories. Thus, the combined cycle gas-fired power plant is the primary conventional technology added in California today for base load purposes. A number of renewable technologies have costs comparable to conventional technologies. Some technologies such as biomass and landfill gas provide additional social benefits beyond the environmental and economic benefits cited above.³⁵

The gas-fired combustion turbine is the main conventional technology used for peaking purposes. Its costs per kWh vary with its use. In some years, it may be used 10% or

³⁴ Subtracting the negative \$2.3 billion benefit of the Business As Usual Portfolio from the \$8.9 billion CPA Portfolio yields a net \$11.2 billion benefit.

³⁵ For example, some biomass such as thinning the forest reduces the number of controlled burns for forest fire protection. Landfill gas use can make better use of existing landfill waste sites.

more of the time. However, the CEC forecasts that in the foreseeable future, peakers will be used only 1-2% of the time. Because these fixed costs must be covered, the cost per kWh varies. The solar technologies are the main peaking technologies – since they mainly supply electricity during the afternoon peak. However, since they have no fuel cost, they will run all the time the sun is shining. Some customers install distributed technologies at their site to improve local power reliability.³⁶

The decentralized resources – efficiency/conservation, fuel cells, and photovoltaics – provide an additional benefit. These resources reduce the transmission and distribution costs. At a minimum, they help reduce the energy lost due to resistance in the power lines. In targeted cases, they can also reduce the capital expenditures for transmission and distribution. The CPA analysis applies no quantified values for these additional benefits.

Table 6-2. Levelized Cost Comparison of Resource Options

Resource	Cost (¢/kWh)
Base Energy Resources	
Combined Cycle	4.3
Fuel Cell	6-8
Biomass	4-10
Landfill Gas	3-6
Geothermal	4-10
Wind	3-5
Conservation	3-6
Peaking Resources	
Gas Peaker*	10-35
Solar Thermal	13-25
Solar Photovoltaic	25-35

Source: CEC, background data for CPA, December 2001

Rate Impact Analysis

Building upon this levelized analysis, the CPA compared the impacts on rates of the central power plants in its Portfolio versus the Business As Usual Portfolio. As the table below shows, the CPA Portfolio averaged a cost of 6.0 ¢/kWh compared to the Business As Usual Portfolio of 6.5 ¢/kWh. The cost of the CPA baseload resources was slightly higher – 5.1¢ versus 4.3¢. However, the CPA peaking resources were significantly cheaper – 17.2¢³⁷ versus 35¢. Together these provided a cost-effective CPA Portfolio

³⁶ BTU's Daily Power Report, "New Energy Corp to Provide Andrew Martin Co. Solar Power," 8 January 2002. Andrew Martin Company is installing photovoltaics to protect its plastics making from power outages.

³⁷ Most of the resources (CPA and Business As Usual) will have long-term contracts of at least 10 years. Demand Reserve is often the one exception – it can be throttled back after a few years if the need is no longer there. For comparability in this analysis, Demand Reserves are assumed to have a 15-year life

that has a lower rate impact than the Business As Usual Portfolio. If gas prices rise significantly above \$3.25-4.00/MMBtu, then this differential will be even greater.

Table 6-3. Rate Impacts

Resource	Generation (GWh/yr)	Unit Cost (¢/kWh)	Total Cost (\$million)
CPA Portfolio			
Baseload			
Wind	2,628	4.5	\$118
Geothermal	1,051	5.0	53
Biomass -- Existing	920	6.5	60
Biomass -- New	307	6.5	20
Landfill Gas	153	6.5	10
sub-total	5,059	5.1	\$261
Peaker			
Solar Thermal	110	20.0	22
Peaker-- Local Reliability	44	17.0	7
Peaker -- Renewable	88	14.0	12
Demand Reserves	166	17.1	29
sub-total	407	17.2	70
CPA Total	5,466	6.0	\$331
Business As Usual			
Peaker	397	35.0	139
Combined Cycle	5,069	4.3	218
Total	5,466	6.5	\$357

Net Present Value

The CPA also conducted a net present value (NPV) analysis comparing the Business As Usual Portfolio with the CPA Portfolio over 20 years at a 5% real discount rate. This analysis, summarized in the table below, shows that assuming the renewable equipment is manufactured outside California, the CPA Portfolio has a NPV cost of negative \$637 million (i.e., a net savings to California).³⁸ The economic development benefits, especially from not spending dollars on out-of-state gas, exceed the costs. By comparison, the Business As Usual case has an NPV cost of \$2.8 billion. If the renewable equipment is manufactured in California, the NPV of the CPA Portfolio actually goes even more negative providing net benefits of \$7 billion.

Finally, the CPA cautions that an average cost-effectiveness number is not necessarily the best measure of value. A number of customers prefer clean energy and are willing to pay more for it. Their particular “cost-effectiveness” analysis is different. Californians

contract. In practice, the contract will often be for a shorter term to provide flexibility. That flexibility comes at a higher price.

³⁸ Some would suggest that the trading credit value of emission offsets could be included in this NPV analysis. CPA has omitted it, preferring to explicitly recognizing it as a non-monetized benefit or impact in the Benefit-Cost analysis performed earlier in this section.

should be offered the opportunity to select cleaner energy based on their own benefit-cost tradeoffs. The CPA is confident the environmental and economic benefits of clean resources exceed the costs for many Californians – and for the State as a whole when the full impacts are considered.

Table 6-4. Net Present Value of Cost – CPA vs Business As Usual

	Business As Usual Portfolio	CPA Portfolio	CPA Net Savings
Out of State Manufacturing			
Initial Cost (\$000)	\$2,583,326	\$4,073,350	(\$1,490,024)
Econ Development (initial)	593,739	2,465,111	1,871,373
Net Initial	1,989,588	1,608,239	381,349
O&M (\$000)	37,181	119,425	(82,244)
Fuel Costs (\$000)	204,002	19,560	184,442
Econ Development (ongoing)	86,190	321,775	235,585
Net Annual Costs	154,993	(182,789)	337,782
NPV of Cost (\$000)	\$3,734,424	(\$637,827)	\$4,372,251
In State Manufacturing			
Initial Cost (\$000)	2,583,326	4,073,350	(1,490,024)
Econ Development (initial)	593,739	9,368,705	8,774,966
Net Initial	1,989,588	(5,295,355)	7,284,943
O&M (\$000)	37,181	119,425	(82,244)
Fuel Costs (\$000)	204,002	19,560	184,442
Econ Development (ongoing)	86,190	321,775	235,585
Net Annual Costs	154,993	(182,789)	337,782
NPV of Cost (\$000)	\$3,734,424	(\$7,212,678)	\$10,947,102
Period, yrs	20		
Real Discount Rate, %	5%		

3. Ensuring a cost-effective CPA Portfolio

There are two major forces at work to insure that CPA projects will stay financially attractive:

- Market forces, and,
- CPA procurement proceedings.

Market Forces

The CPA's primary role is as a banker or power resource broker between developers and the load-serving procurement entities. The CPA ERIP seeks to help develop a wider range of cost-effective and clean energy resources, and to do so in part by offering dedicated public financing to a set of clean resources.

Most projects financed by the CPA will be developed and/or owned by private parties. These parties will provide the seed money, screen through numerous potential deals, and bring forward only those most viable.

The resources and projects themselves must compete in power markets and procurement arenas to secure the long-term contracts or other commitments they need to be financially viable and built. The CPA does not have any authority to set wholesale power prices for load serving entities, nor the retail rates that recover the costs of wholesale power procurement and delivery. Thus the CPA cannot "foist" unacceptable costs on the power system.

CPA Procedures

There are a number of planned procedures to ensure that the CPA's power sector investments are cost-effective and target resources at just and reasonable costs.

- The CPA will continue to solicit projects through ***competitive processes*** that ensure only the best economic deals are considered. All projects will be secured by contracts that spell out the terms in ***public documents***, open to scrutiny by any interested party approved at public meetings.
- The ***CPA Board*** must approve all financial agreements and uphold ***fiduciary duties*** to ensure that these projects have a revenue stream so they can be financed and provide sufficient revenues for CPA to be financially self-sufficient.
- The CPA plans to use ***Expert Reviewer Panels*** to assist it in developing the procurement process.
- Most CPA financed centralized renewable projects will require long-term power purchase agreements with load serving entities. For any contracts with investor-owned utilities, the CPA will **work with the CPUC and within all state regulatory policies**. This approach should lead to long-term contracts that are ***just and reasonable*** – an important tool in ensuring a sustainable competitive market. Similar consultations and public document review will occur for any agreements with local public power agencies.
- The CPA will obtain its financing from capital markets. This means that all project and Portfolio financings will require sufficient and compelling details of the proposed public investments to successfully secure funds from the capital markets. The CPA bonding proposals will necessarily be supported by detailed, thorough documentation and review by rating agencies, independent financial

advisors, and financial institutions. Being ***subject to independent financial market decisions*** adds a degree of rigor to the economic and financial merits of the CPA's activities.

In summary, the CPA's Portfolio not only provides Californians a strong value proposition as planned, but the CPA has mechanisms planned to insure these projects are implemented cost-effectively.

7. Financial Plan

The CPA has begun the development of a detailed financial plan to carry out its projects and programs. This section presents a preliminary financial plan developed in conjunction with the CPA financial advisors. The Plan will be refined as more specific information is available on projects and programs, as the credit structure of the various programs is defined, and as strategic partner relationships are developed. This version, however, demonstrates the CPA's strategy for commercial viability. The CPA by statute must be financially self-sufficient, with no funding from the State General Fund. The financial strategy outlined in this Plan recognizes that and includes repaying the State for its seed money in 2004.

The CPA has revenue bonding authority up to \$5 billion. However, any proposals to issue bonds must be able to demonstrate that the programs are credit worthy, i.e., that there is a high degree of comfort that the bonds will be repaid. The CPA can issue revenue bonds that are tax-exempt. However, not all projects and programs that have been discussed are eligible for tax-exempt financing and the associated lower interest rates. While the CPA is interested in programs that can take advantage of the lower cost tax-exempt financing, it also recognizes that many worthy programs will have to be financed on a taxable basis.

Before financing any projects or programs, the CPA will rigorously assess the creditworthiness of all key parties as well as the overall financial viability of the project. The CPA wants to ensure that the key participants can perform as expected and that the project will be able to meet its overall goals as well.

The Plan provides summarized financial information in four areas:

- In *Financing Activity*, the Plan shows, by year, the amount of capital funds that will be needed to fund the proposed CPA programs. These funds will be used to purchase generation assets; fund loan programs for conservation and distributed generation; and other related needs. The Plan also shows the estimated amount of debt that will be issued to finance these programs. Total debt issued includes, in addition to program costs, funds for issuance costs and reserves.
- In *Revenues and Expenses*, the Plan shows sources of funding for the CPA programs, as well as how those funds will be applied. The primary source of funding will be revenues that will be used to pay debt service and related costs of financing the CPA's programs. The funds shown are larger than the debt service on the bonds, and include debt service coverage, or a margin of revenues above the actual expenses. The Plan assumes coverage of 1.25 times debt service. The primary component of *Expenses* are the repayment of debt service on the CPA's bonds. Additionally, this section shows funds being placed in capital reserves and/or renewal & replacement

Energy Resource Investment Plan

Table 7-1. CPA Draft Financial Plan

	FY 2002-2003	FY 2003-2004	FY 2004-2005	FY 2005-2006	Summary
Financing Activity:					
CPA Capital Activity					
Power Plants	1,998,000	351,334	400,084	324,084	3,073,502
Efficiency	190,000	270,000	270,000	270,000	1,000,000
Total CPA Debt Issued ⁽¹⁾					
CPA Debt Issued - Power Plants	2,308,743	403,242	460,093	371,911	3,543,988
CPA Debt Issued - Efficiency	230,607	307,783	307,957	308,104	1,154,452
Revenues:					
Total Net Payments ⁽²⁾					
Net Payments - Power Plants	89,047	267,638	309,612	352,381	1,018,678
Net Payments - Efficiency	7,799	32,528	62,626	92,792	195,746
Administrative Fees					
Upfront Administrative Fees					
Power Plants	11,544	2,016	2,300	1,860	17,720
Efficiency	1,153	1,539	1,540	1,541	5,772
Annual Administrative Fees ⁽³⁾					
Power Plants	445	1,338	1,548	1,762	5,093
Efficiency	39	163	313	464	979
Other Fees ⁽⁴⁾	4,608	3,697	3,697	3,697	15,697
Existing Renewables Broker Fees	2,278	1,367	1,367	1,367	6,377
Customer Eff. & DG Broker Fees	-	-	-	-	-
Local Reliability Broker Fees	-	-	-	-	-
Strategic Reserves	2,330	2,330	2,330	2,330	9,320
Total CPA Revenues	114,635	308,918	381,636	454,496	1,259,685
Expenses:					
Debt Service ⁽⁵⁾					
Debt Service - Power Plants	75,717	221,746	236,450	251,635	785,547
Debt Service - Efficiency	1,760	18,387	61,341	104,504	185,992
Capital Reserves/Renewal & Replacement Funds ⁽⁶⁾					
Capital Reserves - Power Plants	18,929	55,436	59,112	62,909	196,387
Capital Reserves - Efficiency	440	4,597	15,335	26,126	46,498
Administrative Costs	5,000	5,000	5,000	5,000	20,000
Total CPA Expenses	101,846	305,166	377,238	450,173	1,234,424
Net CPA Revenues	12,789	3,753	4,398	4,323	25,262
State Loan Repayment:					
Cumulative Balance Owed to State	3,739	-	-	-	-
Repayment to State	3,739	-	-	-	-
Net Balance Owed to State	-	-	-	-	-
Operating Reserves⁽⁷⁾	9,050	12,802	17,200	21,523	21,523

Notes:

- (1) Debt issued includes capital costs, issuance costs, debt service reserves, upfront administrative fees, and working capital funds.
- (2) Financial Plan payments reflect 1.25x coverage for net debt service. Actual levels will vary depending on security structure for specific programs.
- (3) Applied to net payment amount.
- (4) 2% broker fees applied to Existing Renewables and Strategic Reserves.
- (5) Debt Service includes estimated debt service net of estimated interest income on debt service reserve and working capital funds.
- (6) Includes funds generated from debt service coverage.
- (7) As our reserves increase, these can become financing reserves to lower borrowing costs as well we as operating reserves.

funds. These funds are expected to be used for ongoing capital and replacement needs of the CPA's assets.

- The *State Loan Repayment* section shows the accumulated amount of funding provided to the CPA by State General Funds, and the amount of funds available each year to be applied to the repayment.
- *Operating Reserves* show the amount of funds that the CPA will accumulate to help fund its operations, provide working capital, and, use for programs.

The Plan shows that with issuance costs and reserves, \$4.073 billion of plant and loan programs financed by the CPA will require the issuance of \$4.7 billion of debt by the CPA. This allows some buffer below the \$5 billion bonding authority. All debt issued by the Authority is assumed to be revenue bonds, which will need to be repaid by specific revenue sources identified prior to bond issuance.

The Plan also shows that most of the CPA's revenues (net payments) will be used for its financing costs (debt service and related costs). There also will be operating and program costs that are currently excluded from the Plan. These costs include plant operating costs, fuel, loan origination and loan administration costs, and other such expenses. The CPA is treating these expenses as pass-through costs which, while not yet fully identified, must be recovered as a part of any specific program.

For its internal expenses, the CPA has two anticipated sources of revenue. The first source is administrative fees from managing the financings. The second source is other fees from the packaging and brokering of transactions that marry other entities' money with the CPA's bulk procurement and other strengths. These additional revenues also allow the CPA to achieve self-sufficiency sooner.

The Plan anticipates moderate increases in the CPA's expenses to facilitate and manage the increasing number of projects within the Clean Growth Portfolio. Over time, CPA revenues will exceed its expenses so that the CPA can build up an operating reserve fund. Initially, these reserves will provide basic working capital for the CPA, and some funding for program development. Over time, the CPA expects that these reserves can be sufficient to provide some level of security for future CPA financings, which will lower its borrowing costs and the cost of power to Californians.

As mentioned earlier, the CPA is still working with potential strategic partners on the best way(s) to structure its financings. The results of these discussions will influence the shape of the financial plan. There are two critical issues. The first is the type and level of security behind CPA financing. The second is the tax status of the debt.

The CPA has financing authority, the ability to contract for projects, and the ability to create a more unified philosophy in addressing the State's energy needs. However, the bonding authority was not created with a defined credit structure, and the CPA has neither an identified customer base to pass on the costs, nor equity to risk, nor the ability

to raise rates to generate revenues. As such its financing structures must be established in recognition of these attributes. There are a number of possible avenues that can be used to address the security for both the bondholders and any other parties with which the CPA may contract. The security does not necessarily need to be the same for all of the CPA programs. The financial plan assumes that the security structure for the programs will lead to an “A” range credit rating; the actual ratings will likely vary by program (if separately secured).

For projects that create statewide strategic energy reserves or serve basic load, the most appropriate structure is one that passes on the costs of those resources to the customer base for which it was intended. Given its structure, the CPA is not in a position to take on project risks; however, it is intending to pass on all the benefits of the projects to the same customer base.

The CPA is also pursuing a number of programs that will assist different groups of customers in making energy efficiency improvements and/or installing distributed generation. Customer groups may include small and large businesses, homeowners, state agencies, and other governmental entities. On the customer side, CPA loan programs must be self-sufficient, and financing will occur only when customers are convinced they will recoup their outlays and take out loans with adequate credit support or loan collateral. Each of these groups will have some unique needs and credit issues. Generally, such programs have been developed by utilities and the program risks are included in the overall financial structure of the utility rather than made to stand entirely on its own credit. Alternatively programs may be created through the contribution of some form of equity that can be loaned and/or leveraged. The CPA is exploring a number of approaches to such programs, but does recognize that some programs could benefit from some form of credit support, even if the program is self-supporting.

Finally, while the CPA is a government agency, it (or any other government agency) does not have the ability to issue tax-exempt debt for all purposes. To take advantage of the lower costs associated with tax-exempt debt, the CPA will be required to adhere to the same federally mandated restrictions that are applicable to all issuers. Certain programs that are of interest to the CPA, such as consumer and business loan programs, will likely be funded with debt that is federally taxable. The ability to use tax-exempt debt for other purposes, such as generation projects, will carry with it certain restrictions on the use of the projects that may not be compatible with the business needs. As it develops its programs, the CPA will seek to take advantage of the lowest cost of funds available, while also taking into account the overall business needs. The financial plan currently assumes a combination of taxable and tax-exempt debt will be issued.

8. Summary Action Items / Next Steps

This Investment Plan necessarily must be implemented in phases and will involve actions by other public and private sector entities. In the next few months, there are several actions that the CPA will take to continue to fulfill its mission:

- Support financing of renewable resources for use by IOUs to satisfy a renewable portfolio standard promulgated either by the Legislature or the CPUC;
- Pursue opportunities to create demand management programs (dispatchable negawatts) that are both statewide and specific to areas of local reliability weakness;
- Initiate program partnerships, in consultation with the CEC and CPUC, to finance energy efficiency and distributed generation for consumers and businesses, with a mechanism to collect voluntary repayment on utility bills, if needed;
- Pursue opportunities (including partnerships) to place renewable technologies and distributed generation on public buildings throughout the State;
- Facilitate contracts with existing renewable project owners to allow them to continue to provide environmental benefits to the state through continued operation;
- Develop the credit/security structure for the various groups of projects; and
- Continue to coordinate with other state agencies in all relevant areas of energy planning and market redesign.

With the development of this plan as its guide, CPA intends to continue to move aggressively to secure projects and programs that can provide 1,800 MW of clean energy in 2002-03.

During the development of this plan several potential changes to the CPA authorizing statute were considered. They are not included in this document because, as a start-up agency, it is premature to suggest changes. However, the Energy Resource Investment Plan will be updated at least annually, allowing an opportunity for suggested revisions as may be needed to carry out the mission of the CPA or to respond to legislative, regulatory or market changes.

Appendix 1. Appropriate Level of Reserves: Background Considerations

In the Plan, the CPA discussed the challenges in quickly defining an appropriate target planning reserve margin in the evolving California market structure. The CPA intends to work with the CEC, CPUC and ISO in evaluating the appropriate planning reserve margin during the next year. But in its analysis on this issue, CPA staff identified a number of background considerations that should be reflected in the final determination of the target reserve level. These considerations are described below.

Historically, utilities had a 15 – 18% *planning reserve* over their expected peak loads. This allowed them to keep the lights on in spite of unscheduled unit outages and unexpected system demands. California has the same need to maintain reliability, with an additional consideration of maintaining reasonable market prices.

California certainly needs enough extra capacity to cover the 10-15% of capacity that is routinely unavailable due to outages. This unavailable capacity comes from two sources. First, the difference between *installed capacity* and *dependable capacity* accounts for about 5%, and second, normal *forced outage* rates account for an additional 5 – 10% throughout the year. Failure to maintain at least this level of protection can mean capacity shortages. In addition to the 10-15% just described,

Key Reserves Terminology

The CPA's focus is ensuring there are enough planning reserves, which in turn, ensures enough operating reserves to keep on the lights. Those two concepts, plus supporting concepts, are defined below.

Operating Reserve –It is an amount of *available capacity* that is unloaded and ready for use in “real time” which is defined as within 10 minutes. It is needed to keep the system balanced from second to second as demand changes, and for unexpected outages of either generating units or transmission lines. The formula is complex but it equates to about 7% of the *system demand* at any given time. The North American Electric Reliability Council, and its western subsidiary, the Western Systems Coordinating Council, has minimum reserve requirements to which California must conform.

Planning Reserve –Since generation takes so long to build, system planners look out into the future to estimate system needs. Each year a multi-year outlook is prepared to estimate expected *system peak demand* for the coming year and the next several years. The expected *dependable capacity* is estimated and compared against the expected *system peak demand*. The excess of *dependable capacity* over *system peak demand* is the *planning reserve*. This *planning reserve* must cover both the needed *operating reserve* and any *scheduled outages* or *forced outages*.

Installed Capacity – This number is calculated by adding together the nameplate rating of all generating units.

Dependable Capacity – This number is the actual amount of production capability of all the units. Sometimes also called Firm Capacity, it is no more than about 95% of the installed capacity and sometimes less. It is less than 100% for reasons such as, water levels or flow restrictions on hydro systems, worn parts, small leaks, plugged tubes, fuel quality, etc. on gas/coal/nuclear powered systems, addition of equipment such as SCRs to older equipment, steam pressure variations in geothermal fields, sunshine intensity, wind speeds, and many other reasons. With over 800 generators in California, it is not surprising that many are not operating optimally at any given moment.

Continued on the next page

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California needs additional capacity to satisfy the needed *operating reserve*.

Electricity is an unusual commodity. It essentially cannot be stored and must be created at the instant it is used. Generation at any moment must equal system demand or the system becomes unstable. Because of these properties, it is not safe or reliable to try to have exactly the generation capacity on-line that equals *system demand*. Extra capacity is needed on-line and ready to ramp up or down to follow the *system demand* as it moves up and down. In addition, in a system as big and diverse as California's, storms, equipment failures and other unforeseen problems happen every day. Some amount of preparation for those moment-to-moment *contingencies* is required to have the system be stable and keep the lights on.

Operating reserve is defined above as the generation that is not operating at this moment, but must be available within ten minutes to provide the stabilizing effects described above. Long experience has dictated that the amount of *operating reserve* needed to keep the system stable moment-to-moment is

is many times that at every instant, there should be about that is either
requirement
or

Putting these principles together implies that the actual extra capacity a system needs to
it could be
or

7% operating reserve
or 17-22% total above the highest system demand expected in the year. No allowance is made in that calculation for *scheduled outages* because they are approved in advance to be taken when loads are lower during fall, winter and spring. Great care must be

Available Capacity – This is the quantity of capacity
other demand
is *Dependable*
Outages and *Forced Outages*.

With the above explanation it is clear that *Available Capacity* will *always* be 10-15% less than installed capacity regardless of the season, and as much 30% less in some

depending on what needs to be
done. The amount of capacity scheduled out varies by

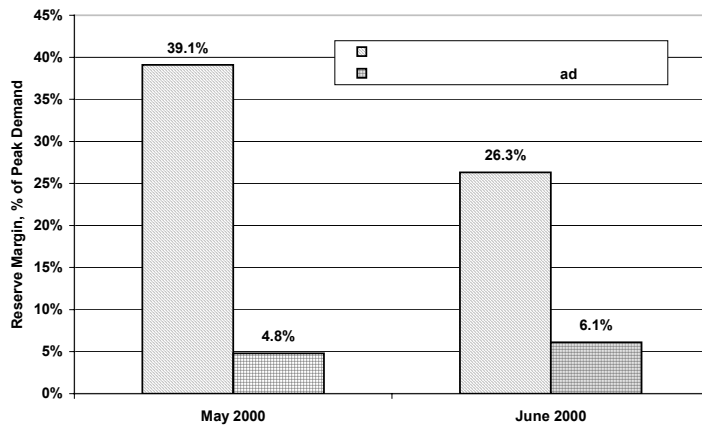
th or a
day, depending on the time frame of concern.

exercised when scheduling outages because if too many outages are scheduled and the system demand is not low enough, it can still be a tight squeeze to have the required *operating reserve*. Fortunately, demand-side measures can be a cost-effective, clean way to provide a modest portion of these reserves.

The above discussion reflects only the *operating uncertainty on plant availability*. There also are *significant planning uncertainty* issues as to whether the right amount will be built and its owners having the right motivations to supply reserves.

- *Sustainability of Emergency Reductions.* It is unclear how much of the peak reduction in 2001 from voluntary customer operational changes will be sustained in future years. The surge in conservation by Californians continues to reduce consumption below historic levels. Energy consumption, even in the winter, is running roughly 5% below a year ago. However, the degree to which conservation will continue into the future is uncertain. The peak demand in 2000 was near 54,000 MW and dropped below 49,000 MW in 2001. Due to uncertainty of the sustainability of the demand reduction, the CEC peak projections for 2002 vary from 50,501 MW to 54,255 MW.
- *Price effects.* Some businesses and large residential users face retail electricity rates that are 40-100% higher than a year ago. The long-term effects of these recent rate increases have yet to be quantified. These businesses and residences may be more motivated to purchase energy saving technologies as appliances and equipment are replaced.
- *How much planned new capacity will actually be built?* In recent months, credit ratings of power suppliers have faltered and plant cancellations or postponements have become common. Private, essentially unregulated, generating companies can build or fail to build plants as they choose based solely on whether projects fit their financial balance sheet. As a result, plant completion plans rise or fall with the price of electricity.
- *How much installed plant will actually operate when needed?* Power plants always have outages. Typically at least 5-10% of existing plants are always unavailable. Since restructuring the experience has not been any better. Indeed, the western US experienced planned reserves 20-30% below forecast, as figure A1 shows. This deficiency played a major role in the high spot prices seen during that time. Under restructuring, generators are not required to spend money on maintenance. Suppliers have no responsibility to have any reserves. It is, at present, not their responsibility to “keep the lights on.” Furthermore, the generating companies know that tight supplies mean higher prices, while a surplus means the opposite.

Figure A1. Reserve Margins: WSCC Forecast vs. Actual, Spring 2000



Source: WSCC

There is a basic difference between today's market situation and the regulated utilities that existed in the past. The vertically integrated utilities had incentive to spend sufficient funds to build enough plants and to keep them available when needed. Under those conditions, a 15% reserve was dependable.

In 1997, when restructuring began, there was a large capacity surplus of 20-30%. Prices were competitive and low, averaging 3 cents per kilowatt-hour. But new plants were not economical at that price and were not built. Loads grew and by the year 2000, the surplus had shrunk, shortages emerged, and prices skyrocketed.

In the new market structure with no one responsible for capacity assurance and with the prospect of continuing high prices and inflated returns, power plant expansions were announced. The CEC reported that some 30,000 MW of new natural gas-fired plants were in the permitting and construction pipeline, and some 3,000 MW were added in 2001.

Since late 2001, power plant additions and construction projects have been canceled and delayed continually. It is now doubtful that any of the planned generating projects, except those nearly completed, will be built unless they have a guaranteed market - namely a long-term contract with the DWR (or in the future with the utilities). The 30,000 MW may quickly drop to 3,000 or at most 6,000 MW.

Moreover, some parts of the state have greater reliability concerns than other areas due to transmission constraints. For example, the CEC believes the San Francisco-San Jose corridor has about a 14% probability of having inadequate capacity in 2003. Even when adequate generating resources exist in these dense urban areas, the entity that controls their operation has market power, or the ability to charge monopoly rents when the system conditions require the use of their resources. Thus, the final uncertainty is about control of scarce resources by the consumers or their representatives - to mitigate market power and alleviate transmission constraints.

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The combination of all these uncertainties creates a significant risk profile for the future of electricity in California. The prudent investor or risk manager responds to uncertainty and high risk with strategies designed to minimize risk. The critical feature of the CPA's Investment Plan is to recommend the prudent investments the CPA can make in efficiency, conservation, renewables and traditional supply so that reliable power can flow to California consumers and the state's economy may operate at the lowest reasonable level of risk of system failure.

In summary, there are many pressures that would lead California to higher reserve margins. Fortunately, the CPA has identified a number of Clean Resource options to potentially achieve such reserves. During the next year, CPA will work with the CEC, CPUC and ISO to determine the appropriate level of reserves for California in light of new information and market conditions that develop over time. In addition, market design changes at the ISO, proceedings at the CPUC and the effectiveness of conservation and demand reduction efforts may also significantly influence the eventual target. In the interim, the CPA is targeting the historic minimum of 15% and expects to analyze in concert with the other involved agencies and adjust as appropriate.

Appendix 2. CPA Signed Letters of Intent for Renewable Energy Projects

BIDDER NUMBER AND NAME		CAPACITY (M W)	ZONE
<u>WIND</u>			
R 12	PacifiCorp Power Marketing	100.00	NP15
R 32.2	Clipper Windpower, LLC	53.00	Oregon
R 32.3	Clipper Windpower, LLC	100.00	NP15
R 49.1	enXco	30.60	NP15
R 49.2	enXco	18.00	NP15
TOTAL NP 15		301.60	
R 24.1	Cannon Energy Corporation	100.00	SP15
R 24.2	Cannon Energy Corporation	200.00	SP15
R 24.3	Cannon Energy Corporation	200.00	SP15
R 26	Windridge, LLC (FP&L)	60.00	SP15
R 32.1	Clipper Windpower, LLC	38.00	SP15
R 38	CVT Marketing Group, LTD	50.00	SP15
R 27	High Winds LLC (FP&L)	150.00	SP15
R 28	Southern Sierra Power (FP&L)	200.00	SP15
R 5.6	Enron Wind Development	33.00	SP15
R 37.1	SeaWest Windpower, Inc.	35.00	SP15
R 5.5	Enron Wind Development	300.00	SP15
R 49.3	enXco	60.00	SP15
R 60.1	Oak Creek Energy Systems	5.40	SP15
R 60.2	Oak Creek Energy Systems	41.80	SP15
R 60.3	Oak Creek Energy Systems	52.50	SP15
R 60.4	Oak Creek Energy Systems	18.00	SP15
TOTAL SP 15		1543.70	
TOTAL WIND		1845.30	
<u>BIOFUEL</u>			
R 7.1	Far West Energy, Inc.	49.90	NP15
R 7.2	Far West Energy, Inc.	49.90	NP15
R 50.1	Sierra Industrial Group	49.90	NP15
R 50.2	Sierra Industrial Group	49.90	NP15
R 70	Permanente Corp.	49.76	NP15
TOTAL BIOFUEL		249.36	
<u>LANDFILL GAS / BIOGAS</u>			
R 48	Ridgewood Olinda, LLC	2.00	SP15
R 44	Monterey RWM D	1.00	NP15
R 57.1	Microgy	1.40	NP15
R 57.2	Microgy	1.20	NP15
R 57.3	Microgy	1.80	NP15
R 57.4	Microgy	1.50	NP15
R 57.5	Microgy	1.00	NP15
R 57.6	Microgy	1.60	NP15
R 57.7	Microgy	2.20	NP15
R 57.8	Microgy	1.80	NP15
R 57.9	Microgy	1.40	NP15
R 57.10	Microgy	2.20	NP15
R 57.11	Microgy	5.30	NP15
R 57.12	Microgy	1.00	NP15
R 57.13	Microgy	1.20	NP15
R 57.14	Microgy	2.40	NP15
TOTAL LANDFILL GAS / BIOGAS		29.00	
<u>GEO THERMAL</u>			
R 58.3	Cal Geo Co.	15.00	NP15
R 58.4	Cal Geo Co.	15.00	NP15
R 58.5	Cal Geo Co.	30.00	NP15
R 58.6	Cal Geo Co.	30.00	NP15
R 58.7	Cal Geo Co.	30.00	NP15
TOTAL NP 15		120.00	
R 53	Mammoth-Pacific	15.00	SP15
R 54	Heber Geothermal Co.	28.00	SP15
R 55	Mammoth-Pacific	60.00	SP15
R 56	Second Imperial Geothermal Co.	32.00	SP15
R 58.1	Cal Geo Co.	15.00	SP15
R 58.2	Cal Geo Co.	45.00	SP15
TOTAL SP 15		195.00	
TOTAL GEOTHERMAL		315.00	
TOTAL RENEWABLE LOIs SIGNED		2438.66	

Appendix 3. Benefit Cost Analysis: Methodology and Data

The CPA enabling statute states that “In developing the investment plan, the authority shall compare the costs of various energy resources, including a comparison of the costs and benefits of demand reduction strategies with the costs and benefits of additional generation supply.”³⁹ This appendix provides the rationale, methodology and data used in that comparison.

Rationale

The statute’s main purpose for creating the CPA is to “ensure sufficient power reserves.” But the statute also includes broader CPA purposes, such as “environmental quality” and to “protect the public health, welfare and safety.” Therefore, the CPA developed the following impacts for comparing generation supply and demand reduction options:

- Cost
- Environmental impacts
- Security
- Economic development

The CPA evaluated options in two steps. First, it selected a set of options to include in the CPA Portfolio. Second, it compared the CPA Portfolio to a Business As Usual Portfolio according to the four impacts above.

Selecting Options for the CPA Portfolio

As discussed in Section 6, CPA selected demand reduction and generation options to include in its Portfolio along the following criteria:

- *Clean resource* – either uses non-fossil fuel (e.g., efficiency, photovoltaic), uses it much more efficiently (e.g., combined heat and power displaces heat or steam from a gas boiler or heater as well as producing electricity), is a much cleaner application where combustion technology is necessary (e.g., low emitting peaker to replace old unit where some power plant is necessary for local reliability reasons) or is an application that provides significant other environmental benefits (e.g., biomass extends the life of landfills or displaces open burning of materials),
- *Cost-benefit* – provides significant, economic and environmental benefits for the investment, according to the four impacts above,
- *Cost-effective* – provides significant energy or capacity for the investment, when compared to other similar resources,
- *Capacity-energy balance* – provides a balance of resources that are baseload in nature (e.g., wind, geothermal, biomass) with peaking resources (e.g., demand reserve, solar) so that over the long term, the Portfolio generally matches the pattern of customer demand and in the near term matches the needs of California given the utility-retained generation, DWR contracts and other available resources.

³⁹ Public Utilities Code section 3369(b)

- *Foundation for leverage* – provides a critical mass of market experience and programs so that the costs of newer clean technologies can be lowered to the point that non-CPA dollars can be invested to accelerate the use of those technologies.
- *Institutionally feasible* – can be financed and implemented without legislative or regulatory policy change.

Given these criteria, CPA selected a portfolio that drew upon efficiency, wind and demand reserves because of their cost-effectiveness and their general ability to meet the other criteria. In addition, a modest quantity (50-100 MW) of other renewables was provided to meet the criterion – “foundation for leverage.” The intent was to provide a balanced portfolio that provided 3,500 MW of capacity and met these screening criteria.

The Business As Usual Portfolio

With the CPA Portfolio defined, a Business As Usual Portfolio was developed that was comparable in MW (3,500) and GWh (9,034) to those supplied by the CPA Portfolio in its full implementation year of 2006. The Business As Usual Portfolio added 2,268 MW of combustion turbines at a 2% capacity factor plus 1,232 MW of new combined cycle plants at 80% capacity factor to supply most of the GWh of energy.

Benefit Cost Methodology

CPA selected one main methodology and two supplementary methodologies for comparing benefits and costs of the two portfolios. The main methodology calculated the impacts over twenty years along the four impact categories identified above. A twenty-year time horizon was selected for several reasons:

- It is consistent with the lifetime of most resource options considered.
- It provides a longer-term perspective for which the Clean Growth Portfolio has the opportunity to provide its fuller beneficial impacts.
- It is consistent with historical power planning time frames.

The two supplementary methods used were a comparison of the levelized costs per kWh of supply and a Net Present Value calculation of the economic impacts of the portfolios. The twenty-year impact methodology benefit was selected as the main methodology because many of the benefits sought by the Legislature and Governor are not easily quantified in dollars and cents. The CPA wanted to explicitly highlight these non-dollar impacts. However, as will be seen, the Clean Growth Portfolio compares well in the supplementary methodologies as well.

Measuring the Impacts

The four impacts – cost, environmental, security, and economic development – are more categories of impact. CPA selected the following specific measures for each impact:

- *Cost* – the investment cost of each technology.
- *Environmental* – tons of smog-forming chemicals (nitrous/nitric oxides, NO_x) and tons of global warming chemicals (carbon dioxide, CO₂) emitted by these resources.
- *Security* – two qualitative measures were used – does the portfolio enhance resource or fuel diversity and does the portfolio use decentralized

technologies that are less vulnerable to terrorist and large supplier disruptions.

- *Economic Development* – three criteria were used—jobs, property tax revenues and total economic development stimulus in the California economy.

The levelized cost methodology only included costs of installation, operations and maintenance. The Net Present Value methodology included these same costs – installation, operations, maintenance – and the economic development criteria.

Data Sources

The data input to these methodologies came from one main source and several supplementary sources. The main source was the Electric Power Research Institute report completed for the CEC in November 2001 entitled “California Renewable Technology Market and Benefits Assessment.” This report identified NOx emissions, jobs (construction and operating), installed costs, operating and maintenance costs, and property tax revenues for most of the technologies in the CPA Portfolio. CPA supplemented this with NOx and CO₂ emissions data for both renewable and conventional technologies from the CEC and Air Resource Board.⁴⁰ CPA also used installed costs values of technologies for which it has received responses to its Request for Bid processes – wind, geothermal, biomass, photovoltaic, fuel cell, and combined heat and power.

For the conventional technologies the air emissions data were also calibrated to a CEC supply simulation analysis of the impacts of an extensive conservation scenario in 2006. These results were consistent with other system wide average emission rates. The jobs and property tax revenue impacts of conventional technologies were taken from a CEC report, “Environmental Performance Report of California’s Electric Generation Facilities”, July 2001, P700-01-001. The installed costs of the new peakers were taken from the CPA’s Request for Bids in the fall of 2001.

The economic development impacts were computed using the economic multiplier of 2.3. This number conservatively represented the economic development multiplier that the CEC computed for each renewable technology using an input-output model that the Oak Ridge National Laboratory had developed on a national basis and calibrated for California. For simplicity, CPA used this multiplier for all resources, including conventional gas-fired technologies.⁴¹

CPA applied this multiplier under two scenarios. The first scenario assumed that the clean technologies were manufactured outside California. Under this scenario the multiplier was only applied to the jobs⁴² and property tax revenues generated by the

⁴⁰ About ¾ of the fuel for biomass facilities is agricultural or timber waste that would have been disposed in open burning. Thus, the emissions rates of biomass power production are reduced ¾ to reflect that those air emissions (or higher) would have occurred anyway without biomass power production.

⁴¹ The economic development multiplier 2.3 is typical for most investments in a community.

⁴² The EPRI number for salary plus overheads of \$70,000 was used to calculate the economic development impacts of jobs for all resources.

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resource. Under a second scenario the clean technologies were assumed to be manufactured in California. Under this scenario, the economic development multiplier was applied to the full installed cost – as well as the ongoing jobs and property tax revenues.

Another component of the economic development analysis was to subtract the expenditures for natural gas necessary to provide 9,034 GWh. This natural gas comes from outside California. The cost of natural gas was assumed to be \$3.25 per MMBtu (million British Thermal Units), which is consistent with the forecast used in the CEC staff's Electricity Outlook report of November 2001. The heat rate of 7,632 Btu per kWh of output was implicit in the CEC market simulation scenario and used to calculate the amount of natural gas used by conventional technologies.

The levelized cost information in cents per kWh was supplied or derived from information provided by the CEC. The net present value analysis used the same economic input data as the impact analysis. In addition, a 5% real discount rate was used to reflect the expected cost of CPA financing after inflation.

The major data inputs for the benefit-costs analyses are summarized in the table below. The results are presented in Section 6.

Table A3. Data Inputs for the Benefit-Cost Analyses

Resource	Environmental Impacts		Economic Benefits			O&M Costs (\$/MWh)	Capacity (MW)	Capacity Factor	Generation (GWh)	Installed Costs (\$/kW)
	NOx Emissions (lbs/MWh)	COx Emissions (lbs/kWh)	Construction Employment (jobs/MW)	Operating Employment (jobs/MW)	Property Tax Revenues (\$/MW-yr)					
Business as Usual										
Combined Cycle	0.06	0.82	0.60	0.04	\$ 4,289	\$ 3.50	1,232	80%	8,636	\$ 900
BAU Peaker	0.17	0.95	1.30	0.08	7,071	17.50	2,268	2%	397	650
CPA Portfolio										
Customer Site										
Efficiency	0	0	4.15	0.12	\$ 21,757	\$ 4.52	500	50%	2,190	\$ 2,000
Demand Response			4.15	0.12	533	171.23	1,900	1%	166	49
PV	0	0	7.14	0.12	25,147	4.52	75	23%	151	6,000
Fuel Cell	0.06	0.75	7.14	0.12	20,000	9.74	50	70%	307	3,700
Combined Heat & Power	0.1	0.75	1.30	0.08	22,138	5.25	150	70%	920	2,035
Centralized Resources										
Wind	0	0	2.57	0.29	9,361	9.52	1,000	30%	2,628	1,300
Geothermal	0	0	4.00	1.67	16,757	19.53	150	80%	1,051	2,000
Solar Thermal	0	0	5.71	0.22	20,279	9.74	50	25%	110	2,500
Local Peaker	0.17	0.95	1.30	0.08	7,071	17.50	100	5%	44	650
Renewable Peaker	0.31	0.25	3.71	2.28	15,848	17.50	100	10%	88	1,000
Existing Biomass	0.23	0.23		1.53	18,213	14.41	150	70%	920	
Biomass	0.23	0.23	4.29	1.53	18,213	14.41	50	70%	307	2,000
Landfill/Digester Gas	0.21	0.30	3.71	2.28	15,848	29.19	25	70%	153	2,000

Appendix 4. The Public Input Process of the ERIP

The California Power Authority conducted an extensive outreach effort to communicate to the public its work on the Energy Resource Investment Plan (ERIP). To begin the discussion, the CPA released a draft document outlining the initial scope and direction of the ERIP and issued a request for qualifications (RFQ) for assistance in drafting the document. A two-day weekend work session was held in November 2001 to give the CPA Board of Directors an opportunity to hear presentations from those responding to the RFQ and to discuss with members of the public issues surrounding the development of the ERIP.

The entire process of developing the Plan – indeed the way the CPA operates – is to be open and accessible to the public. Board meetings typically held every two weeks give the public an opportunity to listen to discussions regarding the CPA’s day-to-day business and a chance to comment on issues prior to decision-making. The statewide public outreach plan for the ERIP continued that philosophy of open public communication and input. The draft plan was posted on the CPA website and sent to the extensive CPA stakeholder list on January 18, 2002. Subsequent changes to the draft were posted immediately on the website, and comments received about the Plan also have been posted for public review. Transcripts of related public meetings and Board meetings are regularly updated on the CPA website.

There were three components of the CPA’s public outreach plan:

- 1) **Public Input Meetings** – The CPA held five public forums where individuals could participate in an open discussion with Board members on the ERIP. The meetings were conducted statewide in five locations: Los Angeles, San Diego, Oakland, Fresno and Sacramento. (A list of attendees is attached.)
- 2) **Stakeholder Groups** – The CPA recognized that there were many organizations that had a desire to weigh in on the scope and direction of the ERIP. Targeted discussions occurred with representatives from consumer, labor, environmental, business, and local government groups.
- 3) **Correspondence** – The CPA was sensitive to those who could not attend a public meeting but wanted to offer input on the ERIP. The CPA website and mailing distribution lists were used as tools to circulate recent drafts of the ERIP and those concerned took the time to write their substantive comments on paper or email, all of which have been reviewed by staff and posted on the website.

The public process that the CPA undertook resulted in a plan that reflects the CPA’s goals and also captures the public input received during the review period. The ERIP process has laid a strong foundation for continuing public input into the CPA’s strategy and investment plan.

Participants at CPA Investment Plan Public Workshops

January 23, 2002 Workshop – Los Angeles

David	Dehnert	So. California Tribal Chairman's Assoc.
Donald	Nixon	Megawatt Energy Corp.
Kristin	Casper	Greenpeace
Kevin	Finney	Coalition for Clean Air
Henry	Orlosky	Harper Lake Energy
Stephen	Torres	Fuel Cell Energy
Gerald	Katz	City of Colton/Public Utilities
Dan	Cashdan	Real Energy
Steve	Greenberg	Real Energy
Hebab	Quazi	Martech Int'l.
Nancy	Pfeffer	Southern California Assn. Of Govts.
Tim	Brosnan	Capstone Turbine
Kyle	DeVine	California Public Utilities Comm.
Lester	G. Lennon	Ramirez & Co.
Tracy	L. Cordes	UTC Fuel Cells
Ed	Borray	Genesis Energy
Lyn	Corum	McGraw-Hill Platts Newsletters
Eric	Maass	Hilton Hotels
Tom	Burhenn	Southern California Edison
Jason	DiNapoli	Spartan Power
B.	C. Monk	Siebert, Brandford, Shank
Mele	Charbonneau	Solar Engineering Industries
Gary	Geschwind	EPRI Solutions
Susan	Schneider	Phoenix Consulting
Maryann	Reyes	Southern California Edison
Russ	Stratton	Energy Systems Int'l.
George	Perrault	Perrault Consulting
Nicole	Cassatta	California Association of Nonprofits
Gary	Holdsworth	Wedbush Morgan Securities

January 25, 2002 Workshop – San Diego

Sid	Morris	City of Chula Vista
Jessika	Osorio	Flex Our Power
David	Olson	EPRI
Robert	Epler	City of San Diego
Amy	Jiron	Planergy International
Jerry	Fabula	City of San Diego
Rich	Sperberg	Onsite Energy
Michael	Guin	SDGE
Willie	Gaters	City of Chula Vista
Pat	Zeitounian	County of San Diego
Al	Lobato	Ingersoll-Rand
Scott	Willet	SDCWA
Kecia	Washington	Sempra Energy
LeAnn	Ayres	SDG&E
Mark	Banks	Planergy International

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J.	P.	Ross	Greenpeace
Jodi		Beebe	Utility Consumer's Action Network
Jerry		Van Leeuwen	City of Escondido
Jess		Tatum	Kyocera International
Brad		Heavner	CALPIRG
Joe		Minner	County of San Diego
Tom		Alspaugh	City of San Diego
William	E.	Claycomb	Save Our Bay, Inc.
Frank		Mazanec	Onsite Energy/Waste Mgmt. Co.
Melanie		McCutchan	Environmental Health Org, Latino Issues Forum, Latino Community Energy Project, Communities for a Better Environment, Ctr on Race, Poverty & the Environment

January 28, 2002 Workshop - Oakland

Patrick		Power	Smart Safety Systems
Rick		Jurgens	Contra Costa Times
Kari		Smith	PowerLight Corp.
Danny		Kennedy	Greenpeace Clean Energy Now!
Barbara		George	Women's Energy Matters
Jim		Salisbury	Pacific Agribusiness
Joseph		Leung	Santa Clara County General Svcs. Admin.
Antonia		Scatton	ecoVenture, Green Capitol Project
Jesse		Mason	BAP Advocates
Danielle		Dowers	S.F. Dept. of Environment
Jan		Pepper	Enertron Consultants
Jerry		Lahr	Assn. of Bay Area Gov'ts
Carl		Walter	
Dennis		Laniohan	Delta Diablo Sanitation District
Kianoosh		Samii	Advanced Energy Concepts
Kim		Crossman	
J.	A.	Savage	California Energy Markets
Joyce		Kinnear	Silicon Valley Power
Bobby		Campo	Mirant Americas
Marie		Harrison	Greenaction
Robert		Redlinger	CMS Viron Energy Services
Kevin		Carunchio	City of San Ramon
Diane	I.	Fellman	Energy Law Group, LLP
Bob		Duncan	
Andrea		Tameron	
Rafael		Friedmann	Ph. D.
Chris		King	eMeter
Sean		Randolph	Bay Area Economic Forum
Bill		Ahern	Consumers Union
Lorna		Rushforth	D&R International
Mike		Spowhn	Dublin-San Ramon Services District
Ron		Pernick	Clean Edge
Alisa		Gravitz	Co-op America
Jill		Ratner	Rose Foundation for Communities & the Environment
Anders		Jepsen	
Justin		Bradley	SVMG
Joe		Desmond	Infotility
John		Kotowski	Global Energy Partners

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Vicki	Swank		County of Santa Clara
Gregg	Morris	Ph. D.	Future Resources Assoc., Inc.
Marie	Harrison		Resident of Bay View - Hunters Point (SF)

February 1, 2002 Workshop - Fresno

Mark	Banks		Planergy
Kevin	Fantz		Greater Fresno Area Chamber of Commerce
Mike	Hart		Sierra Industrial Group
Fern	Feto		Greenpeace
Jon	C. Lantz		RES North America, LLC
Linda	Clark		City of Porterville
Dave	White		COK
Glen	Cardaronella		So. California Edison Co.
Brad	Underwood		City of Bakersfield
Nancy	Daniel		Westside Youth, Inc.
Joseph	Langenberg		
David	Brlectic		City of Reedley

February 8, 2002 Workshop - Sacramento

David	White		County of Kern-General Svcs. Div.
Tim	Michel		Electric & Gas Industries Assoc.
Douglas	Kerner		Independent Energy Producers Ass'n.
Scott	Wetch		Coalition of CA Utility Empl. & State Bldg. Trades
Rob	Hammon		Consol
John	W. Burton		Integral Design
Fred	Schwartz		San Francisco PUC
James	Salisbury		Pacific Agribusiness
Dick	Maclay		Alameda Power & Telecom
Kristin	Casper		Greenpeace Clean Energy Now!
Dick	Good		NORESCO